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Forest Service

Tongass  
National Forest

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# Chasina Timber Sale

## Final Environmental Impact Statement

### Volume II: Appendices A-K



# Acronyms And Symbols

|        |   |
|--------|---|
| ADF&G  | Alaska Department of Fish and Game              |
| AHMU   | Aquatic Habitat Management Unit                 |
| ANCSA  | Alaska Native Claims Settlement Act             |
| ANILCA | Alaska National Interest Lands Conservation Act |
| ASQ    | Allowable Sale Quantity                         |
| BBF    | One Billion Board Feet                          |
| BMP    | Best Management Practice                        |
| CEQ    | Council on Environmental Quality                |
| CFL    | Commercial Forest Land                          |
| CFR    | Code of Federal Regulations                     |
| CZMA   | Coastal Zone Management Act of 1976             |
| DBH    | Diameter at Breast Height                       |
| DEIS   | Draft Environmental Impact Statement            |
| EIS    | Environmental Impact Statement                  |
| EPA    | Environmental Protection Agency                 |
| EVC    | Existing/Expected Visual Condition              |
| FEIS   | Final Environmental Impact Statement            |
| FSH    | Forest Service Handbook                         |
| FSM    | Forest Service Manual                           |
| GIS    | Geographic Information System                   |
| IDT    | Interdisciplinary Team                          |
| KPC    | Ketchikan Pulp Company                          |
| KV     | Knutsen-Vandenberg Act                          |
| LTF    | Log Transfer Facility                           |
| LUD    | Land Use Designation                            |
| LWD    | Large Woody Debris (same as LOD)                |
| MBF    | One Thousand Board Feet                         |
| MELP   | Multi-Entry Layout Process                      |
| MIS    | Management Indicator Species                    |
| MM     | Maximum Modification                            |
| MMBF   | One Million Board Feet                          |
| NEPA   | National Environmental Policy Act               |
| NFMA   | National Forest Management Act                  |
| NMFS   | National Marine Fisheries Service               |
| NOI    | Notice of Intent                                |
| P      | Primitive                                       |
| PR     | Partial Retention                               |
| R      | Retention                                       |
| RM     | Roaded Modified                                 |
| RN     | Roaded Natural                                  |
| ROD    | Record of Decision                              |
| ROS    | Recreation Opportunity Spectrum                 |
| SHPO   | State Historic Preservation Officer             |
| SPM    | Semi-Primitive Motorized                        |
| SPNM   | Semi Primitive Nonmotorized                     |
| TLMP   | Tongass Land Management Plan                    |
| TRUCS  | Tongass Resource Use Cooperative Survey         |
| TTRA   | Tongass Timber Reform Act                       |
| USDA   | United States Department of Agriculture         |
| USDI   | United States Department of the Interior        |
| USFWS  | United States Fish and Wildlife Service         |
| VCU    | Value Comparison Unit                           |
| VQO    | Visual Quality Objective                        |
| WAA    | Wildlife Analysis Area                          |

## Acknowledgments

*front cover:* By Cindy Ross Barber, 1992. The design illustrates the range of interconnected issues addressed in the EIS.



# Volume II

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# **Appendix A**

## **Reasons for Scheduling the Environmental Analysis of the Chasina Project Area**

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# Reasons For Scheduling The Environmental Analysis Of The Chasina Project Area

## Summary

Reasons for scheduling the Chasina Project Area at this time may be summarized as follows:

1. The Chasina Project Area contains a sufficient number of acres allocated to development land use designations (LUDs) to make timber harvest in the area appropriate under the Tongass Land Management Plan (TLMP). Available information indicates harvest of the amount of timber being considered for this project can occur consistent with TLMP standards and guidelines and other requirements for resource protection.
2. Areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).
3. Effects on subsistence resources are projected to differ little according to which sequence these areas are subjected to harvest. Harvesting other areas with available timber on the Tongass National Forest is expected to have similar potential effects on resources, including those used for subsistence, because of widespread distribution of subsistence use and other factors. Harvest of these other areas is foreseeable, in any case, over the forest planning horizon under the TLMP.
4. Providing substantially less timber volume than required to meet TLMP and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the Chasina Project Area is not necessary or reasonable.
5. It is reasonable to schedule harvest in the Chasina Project Area at the present time rather than other areas in terms of previous harvest entry and access, level of controversy over subsistence and other effects, and the ability to complete the National Environmental Policy Act (NEPA) process and make timber available to meet the needs of dependent industries. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EISs that are currently ongoing or scheduled to begin soon.

More detail regarding the scheduling of the environmental analysis for the Chasina Project Area is presented in this appendix in three subsections:

Southeast Alaska Timber Demand

Tongass Land Management Plan

Forest Plan Implementation

## Southeast Alaska Timber Demand

### Introduction.

In general, this section indicates that areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act.

## Meeting Market Demand.

Timber demand in Southeast Alaska can vary dramatically from year to year. The level of demand is dependent on complex interactions among factors that are difficult, if not impossible, for the industry or the Forest Service to predict with accuracy. Such factors include fluctuations in interest rates, housing starts, business cycles in the United States and overseas, changes in the value of the dollar with respect to foreign currencies, changes in import tariffs, and changes in export policies in other countries.

To be responsive to market demand, the Forest Service attempts to provide an opportunity for the industry as a whole to accumulate a supply of purchased but unharvested timber (i.e. volume under contract) equal to about three years of timber consumption. There are a number of reasons for allowing the accumulation of volume under contract. First, this allows the industry ample time to plan an orderly and systematic harvest schedule that meets all timing restrictions and permit requirements. Second, it allows the industry to better manage its financial resources and to secure financing on the basis of longer term timber supply. Third, it allows time for the necessary infrastructure (roads, log transfer facilities, and logging camps) to be put in place prior to timber harvest. Fourth, it allows the Forest Service to develop an orderly progression of timber management projects in various stages of the planning process. Finally, an ample timber supply gives the industry more opportunity to sustain itself through market cycles. If demand for pulp or lumber in any year suddenly increases, producers will have access to enough timber to respond to the increase in demand without waiting for the Forest Service or the Congress to take action. Normally, the unharvested volume under contract will be drawn down during high points in the market when mills increase production, and built up when markets are poor and production declines. In response to changes observed in the volume under contract the Forest Service may consider adjusting its budget and timber program.

From the initiation of a timber sale project, through EIS and decision document preparation, and to the sale of timber from the project usually requires three to four years or more depending on complexity. Such lengthy preparation time means that in order to have a stable timber supply and be able to respond to upswings in the market, there is a need to have ongoing timber management projects in various stages of the planning process. It is also necessary to have a supply of completed NEPA projects available for sale if an increased market demand is to be met.

The timber industry in southeast Alaska is now in a period of transition. Following the closings of the timber industry in southeast Alaska is now in a period of transition. Following the closings of the Alaska Pulp Corporation (APC) pulp mill and the Ketchikan Pulp Corporation (KPC) pulp mill, new mills are either under construction or are being proposed, and existing mills are being upgraded. There is currently a joint venture between KPC and Sealaska for a veneer plant at Ward Cove in Ketchikan. This mill would also use utility grade log for chips. The veneer could be sent to other mills for manufacture into plywood or laminated veneer lumber, or a revamped facility at the former KPC pulp mill site could manufacture the veneer into secondary products. The plant could be on line as soon as the spring of 1999 with a capacity of 150 million board feet annually (Jim Erickson, Sealaska 3/9/98). A new Seley Log and Lumber Company mill opened in February of 1998 on Gravina Island, in the Ketchikan area. The facility will employ 60 people if run at full capacity, and will house both a sawmill and secondary and tertiary manufacturing mills. Product outputs will include decking and fencing, and possibly furniture. The operation is expected to process 30 MMBF annually (Alan Monk Seley Inc., March 1998). As for existing southeast Alaska mills, the Viking Lumber sawmill in Klawock, on Prince of Wales Island, recently underwent a modernizing upgrade and re-tooling; computerized equipment and a whole-log chipper were added (USDA Forest Service 1996). Also, the APC sawmill in Wrangell has been purchased by Silver Bay Logging (Wrangell Sentinel 1/15/98) and will be manufacturing wood products in 1998. All of these mills will depend to some extent on a supply of timber from the Tongass National Forest.

The market demand analysis in the 1997 TLMP was based on a study by David Brooks and Richard Haynes, research scientists at the Pacific Northwest Research Station. Following the release of TLMP a final version of the Brooks and Haynes report was published, and it is this final report that is referenced and cited throughout this Appendix. Three scenarios (low, medium, and high) were developed in the study to display the demand for Tongass National Forest timber through the year 2010 (Brooks and Haynes 1997). For the low scenario, high timber selling values, harvest costs and manufacturing costs limit Alaska's share of markets. Under the high scenario, increased harvest and manufacturing efficiency, with resulting lower costs, make Alaskan mills more competitive. Projected annual timber demand for the next decade is 113 MMBF for the low scenario, 133 MMBF for the medium, and 156 MMBF for the high scenario. These three scenarios do not consider the Seley mill that is operating on Gravina Island, the proposed KPC veneer plant, or the reopening of the APC sawmill in Wrangell. Nor do they account for



shifting markets in Japan and the recent willingness of the Japanese to purchase Alaskan milled lumber, manufactured wood products, laminates, etc. All of these factors would lead to an increase in demand over the totals listed for the three scenarios.

The Allowable Sale Quantity (ASQ) for the Tongass averages 267 MMBF on an annual basis, however, a level of 200 MMBF or less is more likely to be offered over the next few years, given current market conditions and the transition that both the timber industry and the Forest Service are experiencing (USDA Forest Service 1997).

### **Tongass Land Management Plan**

Chapter 1 of this EIS includes an explanation of how this project relates to the Tongass Land Management Plan. That section describes the Land Use Designations (LUDs) which put land areas under different types of management prescriptions. Chapter 1 also explains that the Forest is divided into land areas called value comparison units (VCUs). In most cases, VCUs are roughly equivalent to large watersheds. A VCU may contain one or more LUDs.

The allowable sale quantity (ASQ) calculated in the TLMP is an upper limit, by decade, on the volume of timber that may be offered for sale from suitable timberland on the Forest as part of the regularly scheduled timber sale program. The current ASQ is 2.67 billion board feet per decade, which equates to an annual average of 267 million board feet. There are 676,000 acres suitable for timber management under the Forest Plan. Three LUDs (Timber Production, Modified Landscape, and Scenic Viewshed) account for nearly all of these suitable acres (USDA Forest Service 1997).

#### **1. Cumulative Effects**

The TLMP considers the cumulative effects for forest-wide acres managed for timber production for both the long-term and short-term timber sale programs. These effects are discussed at the end of their respective sections.

Analysis points to the need to schedule harvest in VCUs assigned management prescriptions which permit consideration of timber harvest, including the VCUs within the Chasina Project Area. These VCUs in the Forest plan would be needed to help meet TLMP and TTRA timber supply objectives. The forest-wide cumulative effects analysis in the TLMP supports the conclusion that this harvest can be accomplished within existing standards and guidelines and other requirements for resource protection.

#### **2. Subsistence**

With the passage of the Alaska National Interest Lands Conservation Act (ANILCA), Congress recognized the importance of subsistence resources to rural residents of Alaska. In particular, prior to any disposition of public lands, an agency must first complete a subsistence effects evaluation, including consideration of the availability of other lands (ANILCA 810 (a)).

Based on a review of available harvest volumes for each value comparison unit (VCU) on the Ketchikan Area of the Tongass National Forest, it appeared that in order to meet market demand, most of the Timber Production land use designations would need some level of harvest in the first decade of the 1997 Tongass Land Management Plan. A tentative sale schedule was developed, and will be updated every six months based on this analysis (Ketchikan Area Sale Schedule Summary, March 1997). In short, harvesting at this level to meet market demand, would indicate a level of impact to all subsistence use areas. However, the most significant impacts on subsistence deer habitat would not occur until 20 to 30 years after timber harvest when the second growth canopy closes. When those impacts to subsistence deer habitat are viewed from a reference point 20 years in the future, the particular importance of which areas are scheduled first during a 5-year period appears to be minor.

In considering rural communities that may be most affected by any proposed timber harvest in the Chasina Project Area; Craig, Hollis, Hydaburg, Kaasan, Klawock, Metlakatla, Saxman and Thorne Bay appear to have the strongest cultural and subsistence ties to the area. Each community has its own level of reliance on subsistence, as well as its own level of reliance on the Chasina Project Area for supplying subsistence resources, especially deer. The following information about each community's subsistence use is a summary of more detailed information provided in Chapter 3 of the Chasina Project EIS and the project files.

**Craig** Boat access areas adjacent to or within the immediate vicinity of Kitkun Bay and North Arm Moira Sound is the subsistence use area used on a limited basis by the community. Less than one percent of Craig's deer came from the Project Area WAA's between 1987 and 1994. Analysis shows that there is probably an adequate number of deer to meet the current and future demand.

**Hollis** Boat access areas adjacent to or within the immediate vicinity of Kitkun Bay and North Arm Moira Sound is the subsistence use area used on a limited basis by the community. Three percent of Hollis' deer came from the Project Area WAAs between 1987 and 1994. Analysis shows that there is probably an adequate number of deer to meet the current and future demand for future.

**Hydaburg** Boat access areas adjacent to or in the immediate vicinity of Cholmondeley Sound and North Arm Moira Sound are some of the subsistence use areas for the community. This area will be more accessible to the community with the construction of the logging roads through Sulzer Portage on native land. There is not any reported harvest of deer by this community in the project area.

**Kaasan** Boat access areas adjacent to or within the immediate vicinity of Kitkun Bay and North Arm Moira Sound is the subsistence use area used on a limited basis by the community. There has not been any reported harvest of deer by this community in the Project Area.

**Klawock** Boat access areas adjacent to or within the immediate vicinity of Kitkun Bay and North Arm Moira Sound is the subsistence use area used on a limited basis by the community. Subsistence harvest methods within the community of Klawock have been changing since the road tie with Hollis was made in 1984. Prior to that time subsistence harvest was mostly tied to boating activities. Less than one percent of Klawock's deer came from the Project Area WAAs between 1987 and 1994.

**Metlakatla** Boat access areas adjacent to or in the immediate vicinity of Kitkun Bay and North Arm Moira Sound are some of the subsistence use areas for the community. Eight percent of Metlakatla's deer came the Project Area WAAs between 1987 and 1994. Analysis shows that there is probably an adequate number of deer to meet the current and future demand for future.

**Saxman** Boat access areas adjacent to or in the immediate vicinity of Kitkun Bay and North Arm Moira Sound are some of the subsistence use areas used on a limited basis by the community. There was a very limited amount of deer harvest reported by this community in the Project Area WAAs between 1987 and 1994. This could have been underreported due to that fact that many Saxman residents have a Ketchikan mailing address. However, even if all of the Ketchikan harvest was attributed to Saxman residents, total harvest in the Project Area only amounted to four percent of Ketchikan's deer harvest. Analysis shows that there is probably an adequate number of deer to meet the current and future demand for future.

**Thorne Bay** Boat access areas adjacent to or within the immediate vicinity of Kitkun Bay and North Arm Moira Sound is the subsistence use area used on a limited basis by the community. Less than one percent of Thorne Bay's deer came from the Project Area WAA's from 1987-1994.

As a result of several considerations, including the availability of subsistence resources in non-development land use designations on Prince of Wales Island (such as the Honker and Rio Roberts OGRs, the Semi-remote Recreation LUD in the southwest part of the project area and the Karta Wilderness adjacent to the Project Area), standards and guidelines designed to maintain habitat (such as the 1,000-foot beach and estuary fringes), the relative independence of most communities from subsistence resources in the Project Area, as well as analysis contained in the 1997 Tongass Land Management Plan EIS and earlier analyses, the Forest Service determined to schedule an environmental analysis of the Chasina area. Other projects including Central Prince of Wales, Polk Inlet, Lab Bay, Sea Otter Sound, Staney, Luck, North Thorne, and others, are being implemented, or will undergo environmental analysis within the next 3 to 5 years.

Extensive forest-wide cumulative effect analysis has been included in the 1997 TLMP EIS (TLMP EIS, Part 2, pages 3-529 through 3-685). That analysis, and the tables of data with the maps in Appendix H of the 1997 TLMP EIS are incorporated by reference into this document. The data in Appendix H indicates subsistence hunting of deer and other uses in virtually every area of the Tongass National Forest that have substantial quantities of harvestable timber. The following community information is extracted directly out of the 1997 Tongass Land Management Plan EIS:



All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Craig residents. In the long term, projected deer harvest for all rural hunters and all hunters exceed 10 percent of capability. At some point, a restriction in hunting may be necessary. (1997 TLMP, Part 2, page 3-542).

All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Hollis residents, all rural hunters and all hunters in the short term. However, in the long term, the projected deer harvest for all hunters exceeds 10 percent of habitat capability and all (TLMP) alternatives may have future inadequate habitat capability for the total deer hunted. At some point, a restriction in hunting may be necessary (1997 TLMP, Part 2, page 3-563).

All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Hydaburg residents, all rural hunters and all hunters in the short term. However, in the long term, the projected deer harvest for all hunters exceeds 10 percent of habitat capability and all (TLMP) alternatives may have future inadequate habitat capability for the total deer hunted. At some point, a restriction in hunting may be necessary (1997 TLMP, Part 2, page 3-573).

All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Kasaan residents. In the long term, projected deer harvest for all rural hunters and all hunters exceed 10 percent of capability. At some point, a restriction in hunting may be necessary. (1997 TLMP, Part 2, page 3-591).

All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Klawock residents. In the long term, projected deer harvest for all rural hunters and all hunters exceed 10 percent of capability. At some point, a restriction in hunting may be necessary. (1997 TLMP, Part 2, page 3-601).

All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Metlakatla residents. In the long term, projected deer harvest for all rural hunters and all hunters will also be met. (1997 TLMP, Part 2, page 3-607).

All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Saxman residents and rural hunters. In the long term, projected deer harvest for all hunters exceed 10 percent of capability. At some point, a restriction in hunting may be necessary. (1997 TLMP, Part 2, page 3-643).

All (TLMP) alternatives should be able to provide habitat capability for deer hunted by Thorne Bay residents. In the long term, projected deer harvest for all rural hunters and all hunters exceed 10 percent of capability. At some point, a restriction in hunting may be necessary. (1997 TLMP, Part 2, page 3-664).

The analysis shown in Chapter 3 of this Project EIS is supported by the analysis shown above in the 1997 TLMP EIS. The analyses for ANILCA section 810 are shown in the Subsistence section of Chapter 3, in this EIS. The determinations made from the ANILCA section 810 analysis and findings will be a part of the Record of Decision for this project.

## Forest Plan Implementation

### Review of Available Volume

A review was conducted of each VCU for available volume. This analysis was based on computer inventories and Allowable Sale Quantity (ASQ) calculations used for the TLMP. All areas available for timber harvest under the 1997 TLMP can be expected to be entered for harvest sometime in the future if the plan is to be fully implemented. This analysis represents one scenario for meeting the average annual ASQ of 267 MMBF. Obviously, there can be other scenarios which harvest either more or fewer acres in the Project Area and still meet the ASQ. Harvest projections from this analysis for the Chasina Project Area are shown in Table A-1.

Table A-2 displays the Tongass National Forest Sale Schedule for 1997 and the following five year period of fiscal years 1998 through 2002. As is shown in this schedule and the summary in Table A-3, the timber volume projected to be offered from the Tongass is approximately 225 MMBF per year for the next five years, or about 42 MMBF less than the average annual ASQ of 267 MMBF. However, when sales with a high potential for challenge are factored in, the net probable sale offering for the next five years is approximately 123 MMBF per year. The Ketchikan Area portion of the ASQ for the next ten years is 102 MMBF on an average annual basis. See Appendix

B of the 1997 TLMP for a more detailed discussion. It is currently projected that about 43 MMBF would be available for harvest under the Chasina Project and that the volume would be offered in multiple sales, several in each of years 1998, 1999 and 2000. For those three years the average annual volume sold from this project would be about 14 MMBF per year, or approximately 14% of the Ketchikan Area's yearly ASQ.

### **Areas Suitable for Timber Harvest**

The following is a listing and short description for the Ketchikan Area of existing and possible future timber sale project areas, made up of logical groupings of VCUs. This represents the majority of sites on the Ketchikan Area with suitable acres for timber harvest.

Central Prince of Wales EIS VCUs 557, 577, 579-590, 598-601, 549-554 and 571-574.

The FEIS and ROD for this project were completed in July 1993 with a selected alternative volume of 287 MMBF. Timber sale offerings have been made to KPC under the long-term contract for most of the volume.

North Revilla EIS VCUs 732, 733, 735-740

The Record of Decision for 205 MMBF was signed in August, 1993. Most of the volume in this project was sold in a system of offerings to KPC under the long-term contract. One small area was re-evaluated with an EA and sold under the independent timber sale program.

Polk Inlet EIS VCUs 610-613, 618-622, 624, 674, 675

The Record of Decision for this project was signed in April, 1995. The selected alternative had 112 MMBF of timber volume that has been offered to both KPC and as independent timber sales. The last of the sales from this project are scheduled to be sold in 1999.

Upper Carroll EIS VCUs 737, 744, 746

The ROD for this project was signed in October, 1996, with a selected alternative volume of 34 MMBF. All of this timber has been sold.

Lab Bay EIS VCUs 527-540, 551

A ROD for 42 MMBF was signed in January, 1997. Approximately 1/3 of this volume was sold in 1997. The project is now under litigation.

Control Lake EIS VCUs 574-578, 591-597

A DEIS was published in November, 1995, and a supplement to the DEIS was published in January, 1998. The FEIS/ROD is expected to be completed in 1998.

Chasina EIS VCUs 677-681

A DEIS was published in February, 1997 and a Final EIS is expected to be completed early 1998.

Sea Level EIS VCUs 746, 753, 755-757, 759

Scoping for this project has recently been completed and a DEIS is expected to be published in early 1998. The FEIS is expected in late 1998.

Cholmondeley EIS VCUs 614, 616, 617, 674, and 675.

Scoping for this project has recently been completed and a DEIS is projected in 1998. The FEIS is projected for 1999.



**Port Stewart EIS VCU 713-717, 719, 722-723**

The DEIS is projected to be completed in 1998 with the FEIS projected for 1999.

**Moir EIS VCU 694, 695, 699, 700-704**

This project is scheduled for field investigations and scoping in 1998. The DEIS is planned for 2000.

**Dall Island EIS VCU in Management Area K22**

Scoping is scheduled in 2002 with the DEIS in 2003 and FEIS in 2004.

**Sukkwon EIS VCU in Management Area K21**

Scoping is scheduled in 2002 with the DEIS in 2003 and FEIS in 2004.

**Gravina EIS VCU in Management Area K41**

Scoping and the DEIS are scheduled in 2000 with the FEIS projected in 2001.

Note that several sales on the schedule in Table A-2 have not been listed above, including Luck Lake, Staney, North Thorne, Fire Cove, and Sunny Cove. These projects are located within the boundaries of the projects listed above.

**FEIS****Reasons for Scheduling the Chasina Project for Environmental Analysis**

In addition to the Chasina Project Area's relative ability to provide timber, other factors considered in scheduling it for environmental analysis at its projected timber volume level included:

- 1) This harvest level is consistent with the 1997 TLMP.
- 2) Sufficient volume has been determined to be available in the project area.
- 3) The number and location of Log Transfer Facilities, or other processing facilities, are sufficient to handle this volume of timber within a three year time frame.

Substantial changes in timber demand or other circumstances could affect the rate at which various areas proceed through the NEPA process or the timing of actual timber sale offerings, but these changes are not expected to alter the sequence for initiating and completing the NEPA process for various areas. Time periods of relatively low market demand provide an opportunity to increase available timber supply in anticipation of cyclical higher demand periods. All areas in which commercial timber harvest is authorized under the TLMP are expected to receive some level of timber harvest at some time if the Forest Plan is to be fully implemented. Total environmental impacts viewed in the long term are not expected to differ substantially depending upon the order in which different areas are entered. The "No-Action" Alternative of not proceeding with further harvest at the present is considered in detail in each timber sale project NEPA process. But generally, projects farthest along in the NEPA process are the most efficient and logical to consider for implementation first in order to meet timber supply, timber sale program, and Forest Plan objectives.

Table APP-1  
**TLMP Projected Acres of Harvest by Decade for the Project Area VCUs**

|                    | Acres by Decade |            |            |            |            |           |
|--------------------|-----------------|------------|------------|------------|------------|-----------|
|                    | Alt. 1          | Alt. 2     | Alt. 3     | Alt. 4     | Alt. 5     | Alt. 6    |
| <b>VCU</b>         |                 |            |            |            |            |           |
| 6740               | 59              | 0          | 21         | 5          | 175        | 0         |
| 6780               | 99              | 0          | 160        | 0          | 141        | 0         |
| 6790               | 0               | 80         | 20         | 0          | 0          | 0         |
| 6800               | 0               | 32         | 0          | 8          | 0          | 0         |
| 6810               | 0               | 20         | 0          | 0          | 0          | 40        |
| 6820               | 0               | 0          | 0          | 120        | 0          | 0         |
| <b>Total Acres</b> | <b>158</b>      | <b>132</b> | <b>201</b> | <b>133</b> | <b>316</b> | <b>40</b> |

Table A-2

**Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003**

| NEPA Project        | Sale Name            | Volume (MMBF) |
|---------------------|----------------------|---------------|
| <b>Chatham Area</b> |                      |               |
| <b>FY 98</b>        |                      |               |
| NW Baranof          | Schultz Cove         | 10.9          |
| NW Baranof          | St. Johns            | 9.3           |
| <b>FY 99</b>        |                      |               |
| NW Baranof          | Lisa Creek           | 6.0           |
| 8-Fathom            | Neka I               | 9.0           |
|                     | Small Sales          | 2.5           |
| <b>FY 00</b>        |                      |               |
| Ushk Bay            | Poison Cove          | 19.1          |
| Indian River        | Indian River         | 14.0          |
|                     | Small Sales          | 1.0           |
| <b>FY 01</b>        |                      |               |
| Port Houghton       | Little Lagoon        | 26.0          |
| Indian River        | Ten Mile             | 7.0           |
|                     | Small Sales          | 2.0           |
| <b>FY 02</b>        |                      |               |
| 8-Fathom            | Neka 2               | 5.0           |
| Finger Mtn.         | Crab Bay 1           | 14.2          |
| Finger Mtn.         | Broad Creek          | 12.4          |
|                     | Small Sales          | 2.0           |
| <b>FY03</b>         |                      |               |
| Ushk Bay            | Ushk Bay 1           | 14.1          |
| Port Houghton       | North Houghton       | 11.0          |
| Finger Mtn.         | Inbetween            | 6.1           |
|                     | Small Sales          | 2.0           |
| <b>Stikine Area</b> |                      |               |
| <b>FY98</b>         |                      |               |
| Shamrock            | Clover               | 12.0          |
| Etolin              | Etolin               | 2.2           |
| Turn                | Turn                 | 1.7           |
| Crane and Rowan     | Rowan Mountain       | 16.0          |
| Crane and Rowan     | Crane                | 7.0           |
| Todahl Backline     | Todahl Backline      | 6.0           |
| Twin Creek          | Twin Creek           | 3.0           |
| Canal/Hoya          | Canal/Hoya           | 15.0          |
| Nemo Loop           | Nemo Loop            | 3.0           |
| Swan/Tyee Powerline | Powerline            | 5.0           |
| Mossy               | Mossy                | 0.25          |
| South Lindenberg    | Dakota               | 0.33          |
| South Lindenberg    | S.Lindy Small Sale 1 | 1.0           |
| South Lindenberg    | S.Lindy Small Sale 2 | 1.0           |
| South Lindenberg    | S.Lindy Small Sale 3 | 1.0           |
| Bohemia Mountain    | Bo                   | 0.7           |
| <b>FY 99</b>        |                      |               |
| Houghton/Fanshaw    | Fanshaw 1            | 31.0          |
| Crystal Creek       | Crystal Creek        | 10.0          |
| South Zarembo       | Skipping Cow         | 25.0          |
| Deer Island         | Kuakan               | 17.0          |
| Wrangell Misc Small | WRD Small Sales      | 2.0           |

Table A-2 (cont.)

**Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003**

| NEPA Project          | Sale Name              | Volume (MMBF) |
|-----------------------|------------------------|---------------|
| <b>FY 00</b>          |                        |               |
| South Lindenberg      | South Lindy I          | 2.0           |
| Madan                 | Madan                  | 25.0          |
| King George           | Honeymoon              | 2.0           |
| South Lindenberg      | South Lindenberg II    | 10.0          |
| Woodpecker            | Woodpecker             | 10.0          |
| East Kuiu             | Kuiu I                 | 22.0          |
| Etolin                | Camp Carl              | 1.0           |
| Wrangell Misc Small   | WRD Small Sales        | 1.0           |
| Shamrock              | Shamrock Small Sales   | 2.0           |
| <b>FY 01</b>          |                        |               |
| Douglas               | Douglas I              | 39.0          |
| Frenchy               | Frenchy                | 3.0           |
| Woodpecker            | Track                  | 5.0           |
| Etolin                | Mosman                 | 15.0          |
| Woronkofski           | Woronkofski            | 10.0          |
| Wrangell Misc Sales   | WRD Small Sales        | 1.0           |
| South Lindenberg      | South Lindy Small Sale | 1.0           |
| South Lindenberg      | South Lindy II         | 2.0           |
| <b>FY 02</b>          |                        |               |
| Etolin                | Whaletail              | 15.0          |
| Sunny Bay             | Sunny Bay              | 10.0          |
| East Kuiu             | Kuiu II                | 40.0          |
| Sumner                | Sumner                 | 6.0           |
| Wrangell Misc Sales   | WRD Small Sales        | 5.0           |
| South Lindenberg      | South Lindy Small Sale | 1.0           |
| South Lindenberg      | South Lindy III        | 2.0           |
| <b>FY 03</b>          |                        |               |
| East Kuiu             | Kuiu III               | 20.0          |
| Scott Peak            | Scott Peak             | 15.0          |
| Overlook              | Overlook               | 5.0           |
| Crystal Creek         | Ess Lake               | 5.0           |
| Etolin                | Olive Cove             | 10.0          |
| Back Channel          | Back Channel           | 10.0          |
| South Lindenberg      | South Lindy IV         | 2.0           |
| South Lindenberg      | South Lindy Small Sale | 1.0           |
| South Lindenberg      | South Lindy Small Sale | 1.0           |
| Wrangell Misc Sales   | WRD Small Sales        | 2.0           |
| Petersburg Misc Sales | PRD Small Sales        | 2.0           |
| <b>Ketchikan Area</b> |                        |               |
| <b>FY 98</b>          |                        |               |
| Cloudy                | Cloudy                 | 2.0           |
| KRD LYD               | KRD LYD                | 0.1           |
| Brand X               | Brand X                | 1.8           |
| Craig Small Sales     | Craig Small Sales      | 0.4           |
| Peep Flock            | Peep Rock              | 1.5           |
| Polk EIS              | Cable Drop             | 11.1          |
| Chasina EIS           | Dumpy ATC              | 12.0          |
| Picasso               | Picasso                | 0.6           |
| TB Small Sales EA     | TB Small Sales         | 6.1           |
| Lab Bay EIS           | Big Bob                | 9.8           |



Table A-2 (cont.)

**Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003**

| <b>NEPA Project</b>  | <b>Sale Name</b>  | <b>Volume (MMBF)</b> |
|----------------------|-------------------|----------------------|
| Lab Bay EIS          | Summit/Exchange   | 16.0                 |
| Control Lake EIS     | Wolf Pup          | 1.5                  |
| Control Lake EIS     | North Thorne      | 2.3                  |
| Control Lake EIS     | Big Salt          | 13.2                 |
| Control Lake EIS     | West Steel        | 0.2                  |
| Control Lake EIS     | Hard Steel        | 7.4                  |
| Control Lake EIS     | Lwr Beaver        | 0.1                  |
| Control Lake EIS     | Muskrat           | 0.4                  |
| Control Lake EIS     | Rio Beaver        | 4.8                  |
| Control Lake EIS     | Rush Peak         | 1.0                  |
| Control Lake EIS     | Rush/Angel        | 6.5                  |
| Control Lake EIS     | Gander            | 5.2                  |
| Control Lake EIS     | Beaver Pond       | 0.3                  |
| <b>FY 99</b>         |                   |                      |
| KRD Small Sales EA   | Small Sales       | 0.5                  |
| Sea Level EIS        | Toe-Dance         | 10.0                 |
| Sea Level EIS        | Madder            | 10.0                 |
| Sea Level EIS        | Ten Pin           | 10.0                 |
| Polk Inlet EIS       | Longline          | 2.9                  |
| Polk Inlet EIS       | Lowboy            | 1.1                  |
| Chasina EIS          | South Arm         | 7.9                  |
| Chasina EIS          | Port Johnson      | 11.0                 |
| Chasina EIS          | North             | 7.5                  |
| LYD & Small Sales    | LYD & Small Sales | 2.0                  |
| TB Small Sales EA    | TB Small Sales    | 5.0                  |
| Control Lake EIS     | Steel/Roberts     | 3.9                  |
| Control Lake EIS     | Logjam            | 1.8                  |
| Control Lake EIS     | Kogish            | 7.5                  |
| Control Lake EIS     | Control Lake B    | 10.0                 |
| <b>FY 00</b>         |                   |                      |
| Sea Level EIS        | Orion             | 20.0                 |
| Craig Small Sales EA | Craig Small Sales | 2.0                  |
| Cholmondeley EIS     | Sunny Cove        | 14.0                 |
| Cholmondeley EIS     | Dr. Point         | 15.7                 |
| TB Small Sales EA    | TB Small Sales    | 5.0                  |
| Lab Bay EIS          | Thorne Island     | 3.5                  |
| Control Lake EIS     | Control Lake A    | 12.0                 |
| Staney EIS           | Staney Creek 1    | 10.0                 |
| Luck Lake EA         | Luck Lake 1       | 5.0                  |
| Luck Lake EA         | Luck Lake 2       | 8.0                  |
| <b>FY 01</b>         |                   |                      |
| Port Stewart EIS     | Mongoos           | 30.0                 |
| Craig Small Sales EA | Craig Small Sales | 2.0                  |
| Cholmondeley EIS     | Skowl             | 6.7                  |
| Moir EIS             | Perkins           | 23.0                 |
| TB Small Sales EA    | TB Small Sales    | 5.0                  |
| Staney EA            | Staney Creek 1    | 10.0                 |
| Staney EA            | Staney Creek 2    | 15.0                 |
| Cedar Decline EA     | Cedar             | 5.0                  |
| <b>FY02</b>          |                   |                      |
| Port Stewart EIS     | Cabala            | 20.0                 |
| Gravina EIS          | Dutchman          | 8.0                  |

Table A-2 (cont.)

**Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003**

| NEPA Project              | Sale Name         | Volume (MMBF) |
|---------------------------|-------------------|---------------|
| Gravina EIS               | Palisade          | 7.0           |
| Craig Small Sales         | Craig Small Sales | 2.0           |
| Moirra EIS                | Black             | 11.3          |
| Moirra EIS                | Frederick         | 11.0          |
| N Dall EIS                | Dall              | 10.0          |
| Control Lake EIS          | Control Lake C    | 9.6           |
| North Thorne EIS          | Thorne 1A         | 4.6           |
| North Thorne EIS          | Thorne 2          | 5.0           |
| Kosciusko Old Growth EIS  | KOS 1             | 8.0           |
| Kosciusko Old Growth EIS  | KOS 3             | 3.0           |
| <b>FY 03</b>              |                   |               |
| Port Stewart EIS          | Forreous          | 25.0          |
| Gravina EIS               | Frier             | 5.0           |
| Gravina EIS               | Fling             | 5.0           |
| Craig Small Sales EA      | Small Sales       | 2.0           |
| Scratching EIS            | Santa             | 24.0          |
| Droppings EA              | Drops             | 10.0          |
| Thorne Bay Small Sales EA | Small Sales       | 5.0           |
| North Thorne EIS          | Thorne 1B         | 3.5           |
| North Thorne EIS          | Thorne 3          | 5.0           |
| North Thorne EIS          | Thorne NIC2       | 5.0           |
| Kosciusko Old Growth EIS  | KOS 2             | 4.0           |
| Kosciusko Old Growth EIS  | KOS 4             | 5.0           |
| Red Bay EA                | Red 1             | 3.0           |
| Red Bay EA                | Red 2             | 1.0           |
| Red Bay EA                | Red 3             | 1.0           |
| Sarkar EIS                | Sarkar 1          | 6.0           |

Table A-3

**Timber Sale Schedule Summary - Volume (MMBF) by Fiscal Year**

|                | FY 97 | FY98 | FY99 | FY00 | FY01 | FY02 | FY 98-02<br>Ave. |
|----------------|-------|------|------|------|------|------|------------------|
| Chatham Area   | 64    | 46   | 43   | 44   | 40   | 44   | 43               |
| Stikine Area   | 58    | 72   | 88   | 86   | 79   | 79   | 81               |
| Ketchikan Area | 84    | 102  | 104  | 96   | 97   | 104  | 101              |
| Tongass NF     | 206   | 220  | 235  | 226  | 216  | 228  | 225              |

# **Appendix B**

## **Silvicultural Alternatives to Clearcutting - Study Plan Summary**

# Appendix B

21. Williams  
Alternative to  
Classroom - 21st  
Century Summary



# Silvicultural Alternatives to Clearcutting in the Old-Growth Forests of Southeast Alaska: Study Plan Summary

## Introduction

The USFS has committed to the concept of ecosystem management and has vowed to reduce the use of clearcutting. These mandates have created an information crisis: much is known about the ecological effects, economics, and social impacts of clearcutting, but there is little *documented* experience with other silvicultural systems in southeast Alaska. Alternative silvicultural systems hold the promise of sustained timber production with superior protection of associated resources, but this promise needs rigorous testing.

An interdisciplinary study of ecosystem and social responses to alternative silvicultural systems is being established in a joint effort by the Pacific Northwest Research Station and the Alaska Region of the USFS. The project has two parts: a short-term retrospective study and a longer-term, operational-scale, experimental study. Results from the experimental study will be definitive and reliable, but we recognize that it will not yield quick answers to all of our questions. To provide interim guidance to land managers, we will extend the experimental study with retrospective studies of forest ecosystem responses to natural or human-caused disturbances.

Ecosystem and social responses to be evaluated include: stand dynamics, understory plant diversity and productivity, tree damage agents, deer habitat quality, avian diversity and abundance, stream ecology and biogeochemistry, slope stability, snow accumulation and persistence, economics, landscape aesthetic qualities, and recreational values. All of these responses can be addressed in the experimental study, but the retrospective approach is limited and will be most useful for quickly answering questions about changing ecological conditions and resources, stand dynamics, understory vegetation response, and pest and pathogen dynamics.

This integrated set of studies is meant to supply information needed to select appropriate systems for managing late-successional stands on commercial forest land in southeast Alaska. **This project aims to fill gaps in our knowledge about the application and effects of alternatives to clearcutting.** The principal users of this information will be USFS personnel managing the hemlock-spruce forests of southeast Alaska and interested members of the public.

## **Study Objectives**

### **Biological**

- Determine how alternatives to clearcutting (ATC) affect the survival and growth of remaining overstory trees.
- Determine how ATCs affect new tree germination, establishment, and growth.
- Determine how ATCs affect understory plant diversity and abundance, understory productivity, and the nutritive quality of important wildlife forage species.
- Monitor tree damage that occurs during timber-harvesting.
- Monitor post-harvest tree damage due to wind, dwarf mistletoe, fungi, insects, and other agents.
- Measure the diversity, abundance, and reproductive success of breeding birds in different ATC treatments.
- Quantify the transport of food sources such as aquatic and terrestrial invertebrates and particulate organic matter from streams within ATC units to downstream fish-bearing stream reaches.
- Monitor changes in aquatic invertebrate community composition in headwater streams following ATC treatments.

### **Physical**

- Evaluate the impacts of clearcutting and alternative silvicultural systems on soil water levels, soil movement, sediment production, and slope stability.
- Determine the effects of forest canopy cover and canopy gap size on the accumulation and melting rate of snow in southeast Alaska.
- Determine ATC treatment effects on light availability and microclimate under forest canopies.

### **Social**

- Identify and document technical and operational problems encountered while implementing alternative silvicultural systems and develop management

guidelines based on successful problem resolution or prevention.

- Determine the economic costs of planning, implementing, and monitoring ATC treatments.
- Evaluate the aesthetic effects of silvicultural alternatives.
- Determine the social acceptability of alternatives to clearcutting.

### Experimental Study Design

Three factors and their interactions will be tested: the stand density retained after timber harvest, the spatial pattern of the retained trees (uniform vs. patchy), and the size of *patches* (gaps or uncut reserve areas). Stand density will be measured as total basal area per unit area and treatment levels will be defined in terms of the percentage of initial stand density retained after timber harvest. Post-treatment densities will range from 0 to 100% of the initial stand density (clearcut and uncut control, respectively), with three intermediate densities.

We will test three spatial patterns of the retained trees, holding the stand-level density constant. In one pattern, retained trees will be uniformly dispersed throughout the stand, another pattern will have circular, uncut patches or *reserves* within a uniform matrix, and the final pattern will have circular patches or *gaps* cut into the uniform matrix. The matrix density will vary according to the desired stand-level density, but the number, size distribution, and total area of patches will be the same across all patch treatments. Three size classes of patches will be created with diameters equal to 1-, 2-, and 3-times the average height of the surrounding stand overstory. For an average tree height of 104 ft., this would yield patch sizes of 0.2, 0.8, and 1.8 acres.

This design yields nine treatments:

1. A conventional clearcut
2. A clearcut with 5% of the basal area reserved in isolated single trees
3. Individual tree selection retaining 25% of the basal area
4. Individual tree selection retaining 75% of the basal area
5. An uncut control
6. 25% of the stand retained in uncut patches, with clearcutting in the surrounding matrix (total retention 25%)
7. 25% of the stand retained in uncut patches, with individual tree selection (1/3 removal) in the surrounding matrix (total retention 75%)
8. A group selection cut of 25%, with additional individual tree selection (2/3



removal) in the surrounding matrix (total retention 25%):

9. A group selection cut of 25% of the basal area, with no cutting between groups (total retention 75%)

### **Research Sites**

In the initial phase, one block (replicated treatment set) of the experimental study will be established on each Area of the Tongass N.F., for a total of three blocks. Establishment of three additional blocks is planned if funding becomes available.

We have identified approximately 200 potential retrospective study sites throughout southeast Alaska and additional sites continue to be found. Over the expected 3-year life of the retrospective study we will intensively examine 25-35 of the most promising sites.

### **Cooperators**

The PNW Research Station Forestry Sciences Laboratory (Juneau), the NFS Alaska Region, and State and Private Forestry (Alaska Region) will cooperate in project planning and implementation. Scientists from the PNW Station's Forest Environment Research (FER), Forest Management Research (FMR), and Forest Protection Research (FPR) programs will form an interdisciplinary team to conduct this research. This team will work closely with their NFS counterparts at the Regional, Area, and Ranger Districts levels to plan and implement studies. At present, university cooperation has been secured at the Oregon State University Forest Engineering, Forest Science, Forest Resources, and Botany Departments; the University of Washington Center for Streamside Studies, the University of Montana School of Forestry, and Humboldt State University. The Aerial Forest Management Foundation has also indicated their desire to participate in this project.

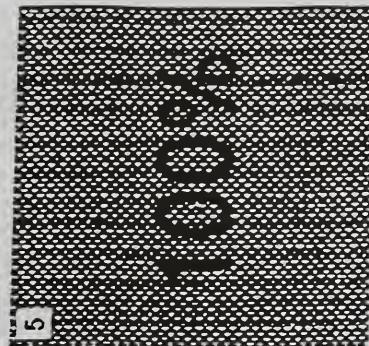
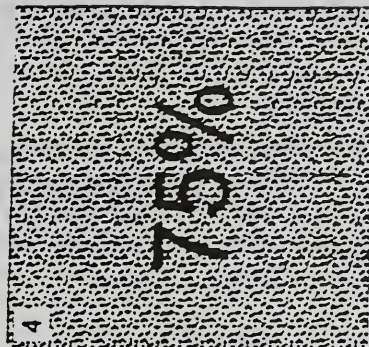
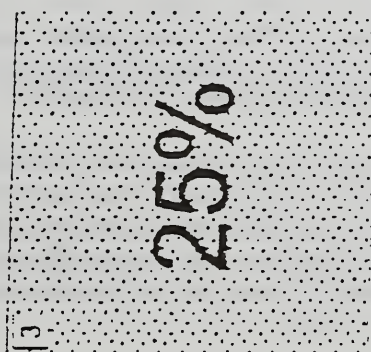
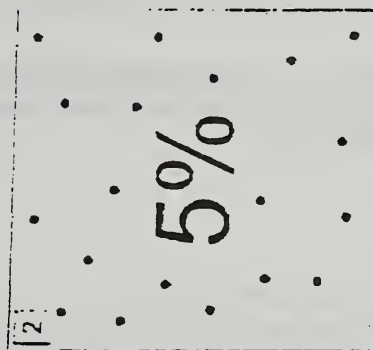
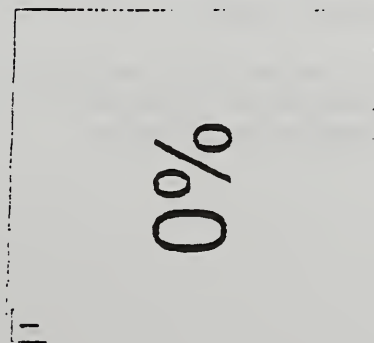
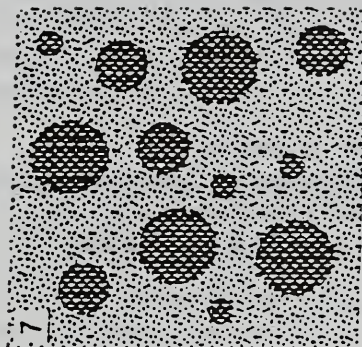
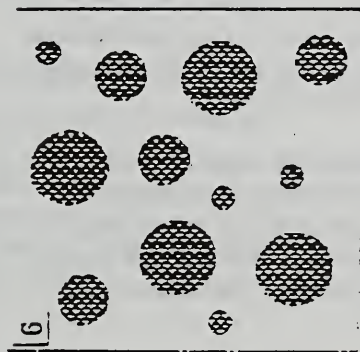


Matrix Density:

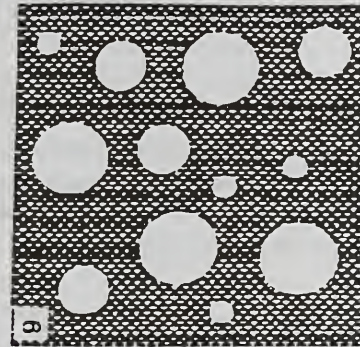
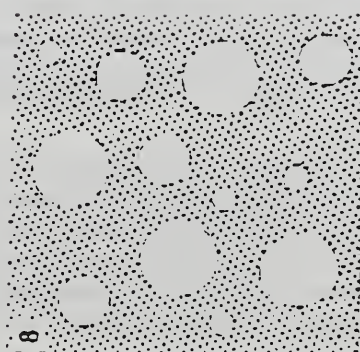
0%

66.7%

Reserve  
Treatments



Gap  
Treatments



Treatment  
Number

1

Matrix Density:

33.3%

100%

Figure 1

## Questions Frequently Asked About the ATC Study

### *What is the study?*

This study is a joint effort of the USDA Forest Service's Alaska Region and the Pacific Northwest Research Station. The study has an experimental component and a retrospective component. The experimental study will apply nine different silvicultural treatments to large (40-60 acre) units and the set of nine treatments will be repeated in several areas on the Tongass National Forest. Because results from the experimental study will not be available for some time, a retrospective study of past partial cutting and its effects is also planned. Results from this study will be available to guide managers within 3-5 years.

### *What is the purpose of the study?*

The study is being done to see if harvest methods other than clearcutting can be effectively and economically done in southeast Alaska. The study is being undertaken in response to the 1992 direction by the Chief of the Forest Service to reduce the amount of clearcutting and to address the concerns of some groups who feel clearcutting reduces wildlife habitat, damages fish habitat, and is visually undesirable.

### *What are the objectives of the study?*

The effects of these harvest treatments on a number of resources will be studied. Included are: damage to the residual trees, amount of soil disturbance, effects on soil stability, ground water, stream sedimentation, wildlife, birds (mainly migratory birds that only utilize the Tongass for a part of the year), economics, spread of insects and diseases, and the public's perception of the different harvest methods.

Of great concern is the damage to the residual trees because the trees in southeast are thin-barked and easily damaged by logging activities. These residual trees are the ones we are counting on to provide specific conditions or structure in the future. If these trees get damaged and infected with disease, they may not live as long as hoped for and our objectives won't be met. There are also several diseases that can be transmitted from the residual trees to the new trees that will come in after harvest. The rate and intensity of this disease spread is also of concern.

### *What are the treatments?*

A total of nine harvest units at least 40 acres in size make up a study block. Each harvest unit will receive a different harvest treatment. Initially, there will be three study blocks located across the Tongass - one each on the Ketchikan, Stikine, and Chatham areas.

The nine harvest treatments are:

1. No harvest.
2. Clearcut.
3. Leave 5% of the trees equally spaced across the unit.
4. Leave 25% of the trees more or less equally spaced across the unit.
5. Leave 75% of the trees more or less equally spaced across the unit.
6. Leave 25% of the trees in small group ranging in size from 1/2 to 2 acres in size. Harvest all of the trees between these groups.
7. Harvest small groups ranging in size from 1/2 to 2 acres in size. All trees will be harvested in these groups. In between these groups, leave 1/3 of the trees more or less equally spaced. The net result is leaving 25% of the total number of trees in the unit.



8. Harvest 25% of the total trees. Create small gaps ranging in size from 1/2 to 2 acres in size. Cut all trees in these gaps. Do not harvest any trees between the gaps. The net result will be to leave 75% of the total number of trees in the unit.
9. Harvest 25% of the total trees. Leave small unharvested groups ranging in size from 1/2 to 2 acres in size. In between these unharvested groups, remove 1/3 of the trees more or less equally spaced across the unit. The net result will be to leave 75% of the total number of trees in the unit.

***Why include a clearcut treatment? Aren't there enough existing clearcuts to study?***

In order to accurately determine changes resulting from timber harvesting, we need to know the conditions on a site prior to treatment. We don't have the detailed pretreatment information necessary on existing clearcuts. Also, in order for an experiment to be statistically valid, treatments must be assigned to the units at random, prior to treatment.

***Why were these particular treatments chosen?***

The chosen treatments emulate stand structures that occur in native forests in southeast Alaska. These patterns result from a variety of disturbance events, ranging from the death of a single tree from fungal attack to large-scale blowdown during violent windstorms. Medium-scale disturbances often leave patches of trees unaffected or may only remove a small group of trees. The treatments vary in both disturbance intensity and disturbance pattern.

***Why use helicopters to yard when cable systems are more commonly used in southeast Alaska?***

Some of the study treatments could be easily harvested with common cable yarding systems. A few of the treatments are possible only with helicopters or tractors. In an experiment such as this, all treatments must be harvested the same way, otherwise it is impossible to determine what caused the observed response—the treatment or the harvest method. We aren't suggesting that helicopters are the only suitable method for partial cutting, just that they are the only system that can accomplish all of our treatments.

***Are similar studies underway elsewhere, or have they been tried in the past?***

The DEMO study in Oregon and Washington has similar objectives and treatments, but it focuses on Douglas-fir/western hemlock forests and will not be applicable to our region.



# **Appendix C**

## **Riparian Area Prescriptions**

# Appendix C

Appendix C  
Exercises

## RIPARIAN

### Forest-wide Standards & Guidelines

#### Riparian area: RIP1

##### *I. Definition*

- A. Riparian areas encompass the zone of interaction between the aquatic and terrestrial ecosystems, and include riparian streamsides, lakes and flood plains with distinctive resource values and characteristics.

##### *II. Objectives*

- A. Maintain riparian areas in mostly natural conditions, for fish, other aquatic life, old-growth and riparian-associated plant and wildlife species, water-related recreation and to provide for ecosystem processes, including important aquatic and land interactions. For further direction, refer to the Fish, Wildlife, Recreation and Tourism, Beach and Estuary Fringe, and Soil and Water Forest-wide Standards & Guidelines. The following is a list of objectives pertaining to riparian areas. (Also consult FSM 2526.)
  1. Assure the protection of riparian habitat. (Consult Tongass Timber Reform Act, Section 103 (a)).
  2. Manage riparian areas for short and long-term biodiversity and productivity.
  3. Maintain natural streambank and stream channel processes.
  4. Maintain natural and beneficial quantities of Large Woody Debris over the short and long term.
  5. Provide for the beneficial uses of riparian areas by maintaining water quality. (Consult Best Management Practices, Chapter 10 of the Soil & Water Conservation Handbook, FSH 2509.22 and Appendix C of this document.)
  6. Maintain or restore the natural range and frequency of aquatic habitat conditions on the Tongass National Forest to sustain the diversity and production of fish and other freshwater organisms.
  7. Consider the management of both terrestrial and aquatic resources when managing riparian areas. Consider the effects of terrestrial and aquatic processes on aquatic and riparian resources.
  8. In watersheds with intermingled land ownership, cooperate with the other landowners in striving to achieve healthy riparian areas.
  9. Design and coordinate road management activities to provide for the needs of wildlife and provide passage of fish at road crossings. (Consult the Aquatic Habitat Management Handbook, FSH 2609.24.)
  10. Evaluate the effect of management (including windthrow) of adjacent areas on riparian habitats.
  11. Coordinate and consult with state and federal agencies on riparian management issues, as appropriate. Coordinate activities which affect the Coastal Zone with the State of Alaska Office of Management and Budget, Division of Governmental Coordination, to ensure consistency, to the maximum extent practicable, with the enforceable policies of the Alaska Coastal Management Program.

#### RIPARIAN PLANNING: RIP2

##### *I. Project Planning*

- A. Identify and delineate Riparian Management Areas (RMA's) for each project where ground disturbance will occur. RMA's are areas of special concern to fish, other aquatic resources and wildlife. They are generally delineated as identified in the process group direction (RIP2, III, E). Areas managed to provide a reasonable assurance of windfirmness of the RMA are not considered to be part of the RMA.
- B. Complete a watershed analysis before making site-specific adjustments to Process group standards and guidelines. Adjustments to the guidelines may be made only if the objectives of the



group(s) can be met. Consult Appendix J of the Forest Plan for direction on the use of watershed analysis.

- C. On those projects and activities that are in, or influence, Riparian Management Areas, assure interdisciplinary involvement and consideration of riparian resources in project planning and in the environmental analysis process.
- D. Ensure that permit holders, contractors, and/or purchasers understand Riparian Management Areas and riparian management objectives.
- E. Evaluate Riparian Management Area windthrow risk when locating and designing adjacent management activities. Minimize accelerated windthrow. (Consult BMP 12.6a of the Soil and Water Conservation Handbook and the Process group Standards and Guidelines (RIP2, III, E)).

### II. *General Standards and Guidelines by Activity*

- A. Special Use Administration of Lands (Non-Recreation).
  - 1. Permit activities, consistent with other Special Use direction, which do not significantly reduce the capability of Riparian Management Areas to: 1) maintain or improve associated fish or wildlife habitat, or 2) protect water quality for beneficial uses.
- B. Minerals and Geology Administration, plan of operations.
  - 1. Use state-of-the-art techniques for developing minerals to reduce impacts to riparian resources to the extent feasible. Include mitigation measures that are compatible with the scale of proposed development and commensurate with potential resource impacts.
  - 2. Apply appropriate Transportation Forest-wide Standards & Guidelines to the location, construction, and maintenance of mining roads affecting riparian areas.
  - 3. Manage mineral exploration and development activities to be compatible with the Process group goals and objectives for Riparian Management Areas.
  - 4. Manage mineral activities to maintain the present and continued productivity of anadromous fish and other foodfish habitat to the maximum extent feasible. (Consult ANILCA, Sec. 505 (a).)
  - 5. Apply timing restrictions to instream construction and other minerals activities to protect fisheries habitat and mitigate adverse sedimentation, and to avoid critical wildlife mating, hatching, and migrating periods.
  - 6. Minimize the effects of mineral development and related land disturbance activities on the beneficial uses of water by applying Best Management Practices.
  - 7. Locate material sites and marine transfer facilities outside Riparian Management Areas if reasonable alternatives exist.
  - 8. Ensure that disturbed areas are revegetated in accordance with project plans.
  - 9. Approve reclamation plans in which mineral activities leave riparian project areas as natural in appearance and function, as is feasible.
- C. Recreation Use Administration
  - 1. Locate, design, and operate only those recreation projects which are necessary to accommodate public use of the water and shoreline areas (i.e., boat or floatplane docks, launching ramps and associated access roads and trails). Where feasible, locate parking, campgrounds, sanitation and other recreation facilities outside the Riparian Management Areas to avoid adverse effects on water quality and riparian function.
  - 2. For existing facilities, consider relocating the facility outside of the Riparian Management Area. Consideration should be based on current and anticipated effects on riparian values, desired recreation experience, public issues, application of Best Management Practices to minimize the effects of recreation facilities on the beneficial uses of water, and costs of relocating the facility.
- D. Soil Inventory
  - 1. Field verify and define high hazard and very high hazard soils during project level planning.
- E. Watershed Resource Planning
  - 1. Manage activities to meet State water quality standards and protect aquatic and terrestrial riparian habitats, channel and streambanks, and provide for flood plain stability.



- a) Identify soil and water quality requirements for project-level activities.
- b) Apply Best Management Practices to minimize the effects of land disturbing activities on the beneficial uses of water.
- c) Determine flood plain values and plan to avoid, where possible, the long and short-term adverse impacts to soil and water resources associated with the occupancy and modification of flood plains.
- d) Complete a watershed analysis before making project level site-specific adjustments to Process group standards and guidelines. Adjustments to the guidelines may be made only if the objectives of the process group(s) can be met. Consult Appendix J of the Forest Plan for direction on watershed analysis. The intensity and scope of watershed analysis will vary according to the issues of concern.

## F. Timber Resources

1. No commercial timber harvest is allowed within 100 feet horizontal distance either side of Class I streams and Class II streams which flow directly into a Class I stream. (Consult the Tongass Timber Reform Act.)
  - a) Included in the definition of Class II streams flowing directly into a Class I stream are all Class II tributaries of a Class II stream that flow into a Class I stream without an intervening Class III segment. Mandatory minimum 100 foot buffers will not apply to: 1) A Class II stream that flows directly into the ocean or joins a Class I stream only at lower than mean high tide; and 2) A Class II tributary stream segment that flows into a Class III stream that in turn flows into a Class I stream.
  - b) The 100 foot measure is a horizontal distance measure from the bankfull margins.
2. Protect Riparian Management Areas, in accordance with the intent of the Alaska Anadromous Fish Habitat Assessment (1995), through application of the direction contained in Process group standards and guidelines (RIP2, III, E). A project may incorporate site-specific adjustments to the standards and guidelines following completion of a watershed analysis. Adjustments to the standards and guidelines may be made only if the objectives of the process group(s) can be met. Consult Appendix J for direction on implementing watershed analysis.
3. Apply Best Management Practices to minimize the effects of timber harvest and related land disturbance activities on beneficial uses of water.
4. Avoid Riparian Management Areas when other feasible locations for personal use wood cutting are available. If personal use wood cutting is allowed, design harvest in such away to meet process group objectives (Section III,E).
5. In locating and designing timber harvest activities, require special consideration and mitigation to ensure that Riparian Management Area characteristics for fish and wildlife habitat, water quality, and other riparian-associated resources are maintained.
6. Provide protection to fish and wildlife during critical periods of their life cycles by applying seasonal restrictions on timber harvest and road use activities, to the extent feasible.
7. When stream crossings are required to harvest timber, perform investigations to compare the environmental consequences of road crossings versus yarding corridors, and select the action of least impact.
8. Streamcourse protection plans (consult BMP 13.16) are required for harvesting activities within the minimum 100 foot required buffers designated in F(1) above.
9. Plan timber harvest settings that cross or include streamcourses or include V-notches to avoid adverse impacts to Riparian Management Areas and soil and water resources. Unless stated otherwise in the Process group direction, the following apply:
  - a) Trees or tree-parts yarded across or along Class I, II or III streamcourses shall be fully suspended when crossing the streamcourse or yarding the full length of the stream or drainage, unless an alternative is approved in the operating plan or timber sale contract which meets the objectives for Riparian Management Areas.
  - b) Unless agreed otherwise in the operating plan or timber sale contract, and consistent with safe practices, trees identified for harvest will be felled to avoid: (1) Riparian Management Areas designated for "no commercial timber harvest", and, (2)

streamcourses. Trees may be wedged, jacked, lined, or otherwise pulled when necessary. Trees accidentally felled into streamcourses or wind fallen trees shall be removed only following approval by the Sale Officer, and only if such removal meets riparian management objectives for the process group.

- c) At the time agreed in the operating plan or timber sale contract, all trees, except those within guyline circles, which cannot be felled to avoid falling in streamcourses, should be left standing until yarding is in progress on the landing to which the trees will be yarded. Trees within the guyline circle will be felled as agreed in the operating plan or timber sale contract.
- d) Split yard away from streams whenever feasible.
- e) Allow no timber salvage within 100 feet in width on each side of Class I streams or on those Class II streams which flow directly into Class I streams. In addition, allow no timber salvage in Riparian Management Areas defined for each process group, with the following exception: salvage could be allowed following watershed analysis if the salvage activity is needed to meet or further riparian management objectives for the process group. This salvage will not contribute to the Allowable Sale Quantity.
- f) In accordance with section e. (above), windthrown timber in Riparian Management Areas should not be subject to salvage unless approved by a line officer in consultation with a fishery biologist or hydrologist.

### G. Wildlife Resources

- 1. Integrate Riparian Management Areas into any modifications to the design and location of small old-growth reserves (consult the Old-growth Habitat Land Use Designation).
- 2. Use riparian corridors in the design of wildlife travel corridors to provide horizontal connectivity between watersheds, and vertical connectivity between lowland and alpine areas.
- 3. Consider wildlife needs in the design and management of Riparian Management Areas. Give special emphasis to habitats of riparian associated species, for example, designated brown bear feeding areas. (See Wildlife Forest-wide Standards & Guidelines.)

### H. Transportation Systems

- 1. Use road closures, maintenance, and other measures to keep road-surface and road-side erosion at low or near background levels. Assure long-term fish passage through structures at road crossings on class I and II streams as described in process group direction and the Fish Standards & Guidelines. Utilize Best Management Practices to control effects of transportation systems on water quality and fish habitat.

## III. Stream Process group Specific Standards and Guidelines for Timber Harvest

- A. Stream Process groups are stream channels which share similar formative processes (consult Appendix D). They reflect the long term interaction of geology, landform, climate, and riparian vegetation. Classification considers the interrelationships among runoff, sediment transport and vegetation along stream banks. The following standards and guidelines are designed to provide essentially natural watershed function and channel processes. Apply these standards and guidelines in Land Use Designations which allow timber harvest.
- B. Standards and guidelines for process groups are management direction for Riparian Management Areas. Areas managed to provide a reasonable assurance of windfirmness of the RMA are not considered to be part of the RMA. The standards and guidelines (except for the minimum 100-foot buffers required by TTRA) may be adjusted for a project on a site-specific basis following completion of a watershed analysis. Adjustments to the standards and guidelines may be made only if the objectives of the process group(s) can be met. Consult Appendix J for direction on the use of watershed analysis.
- C. Stream class IV will be treated as part of the hillside under slope stability standards and guidelines (see Soil and Water Forest-wide Standards & Guidelines). Apply Best Management Practices.
- D. Apply the floodplain process group direction (see "F" below) for estuarine process group channels not buffered using Beach and Estuary Fringe Standards & Guidelines.



- E. The following standards and guidelines (in "F") are designed to meet the intent of the Anadromous Fish Habitat Assessment (1995) for timber harvest activities occurring in each of the Forest's stream channel process groups. Definitions for terminology used in the Process group Standards and Guidelines follow:
1. Where the direction states "no commercial timber harvest", this is a legal mandate of the Tongass Timber Reform Act of 1990.
  2. Where the direction states "no programmed commercial timber harvest", this is management direction that means no timber harvest will be scheduled, but that unprogrammed commercial timber harvest could be allowed where it meets the objectives of the process group (as determined for the project after completion of a watershed analysis). Forest Products sales (reference FSM 2450) are not permitted unprogrammed activities.
  3. Class II (non-direct) - A Class II stream that does not flow directly into a Class I stream (see the definition under Timber Resources, above).
  4. Buffer measurements - Distance for the first 100 feet from the stream channel is measured horizontally. All other measured distances are slope distances.
  5. Salvage harvest - Removal of dead standing or downed trees. Salvage can include the incidental removal of green trees if needed to make logging safe.
  6. Definitions for site-potential tree height, stream class, active channel, flood plain, and riparian corridor are located in the glossary.
- F. Process groups (see following tables).



## Process group: Alluvial fan (AF1, AF2 and AF8 channels)

**Description:** Alluvial fan channels flow directly over the alluvial fan landform. These are dynamic multi-branched channels that periodically change course within the landform. Stream gradient ranges from 1 to 3 percent on the lower half of the alluvial fan and increases toward the fan apex. The alluvial fan channel is associated with high gradient contained channels; therefore streamflow is dependent on mountain slope runoff. Groundwater discharge is also significant. Surface flow may be intermittent as substrate consists of sand to cobble size material. During low flow periods stream flow may run subsurface in the middle section of the alluvial fan and emerge on the lower section. Aggradation of material is the dominant process on the alluvial fan and fine sediment may be deposited in the low gradient section. The active channels on alluvial fans often include multiple high flow channels and unvegetated gravel or cobble outwash lobes with ill-defined channel banks. Alluvial fans typically support large spruce with diameters (DBH) of 30 inches and have average site-potential tree heights of 140 feet. Downed wood serves as nurse logs for regeneration.

**Desired condition:** Stream systems relocate naturally in an unpredictable pattern across the alluvial fan. Large wood occurs across the fan, and is important for the retention and metering of sediment into stream systems, and to create pools for fish rearing habitat. Some amount of large wood is available to the stream wherever the stream may be located on the fan. Wood may be excavated by fluvial processes on the fan.

**Objectives:** Maintain near-natural quantities of large wood by assessing the site's old-growth type and managing for the natural frequency and size distribution for large, downed wood and standing trees on the fan. (Consult "Ecological Definitions for Old-growth Forest Types in Southeast Alaska," Forest Service publication R10-TP-28.) In the stream channel, meet the natural range of aquatic habitat features for large wood size and distribution described in the Alaska Anadromous Fisheries Habitat Assessment (Forest Service publication R10-MB-279, Appendix C.1. on fish habitat objectives).

Implement BMP 13.9. Provide for natural fish migration. Do not divert stream channels.

Apply the following management direction at the project level to streams in this process group. Complete a watershed analysis before making project site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### Stream class/Activity

#### I, II, (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the Riparian Management Area, which is the greater of the active portion of the alluvial fan or 140 feet (the height of one site-potential tree) from the current channel(s). Manage across the remainder of the fan (no more than 10% of the fan harvested in a 30 year period) with the objective of leaving large trees within the stand for future recruitment to stream channels.

#### II (non-direct), III/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, which is the greater of the active portion of the alluvial fan or 140 feet (the height of one site-potential tree) from the current channel(s). Manage across the remainder of the fan (no more than 10% of the fan harvested in a 30 year period) with the objective of leaving large trees within the stand for future recruitment to stream channels.

## **I, II & III/Harvest Controls**

Yard in a manner to minimize baring of mineral soil and such that new human-caused channelization does not occur across the entire alluvial fan. The objective is to minimize alder growth and formation of new channels (ref. BMP 13.9). Where trees are removed, utility/cull logs should be left distributed across the alluvial fan.

## **I, II & III/Roads, Borrow Pits, Drainage Structures**

Discourage use as borrow sources. Do not allow borrow pits on active fan. Avoid crossing fans where possible. If required, use bridges or depending on projected use, install vented fords utilizing culvert(s) to provide for controlled overflow to minimize downstream disturbance. The objective is to maintain fish migration where needed and avoid diverting stream channels.

## Process group: Flood plain/Glacial Outwash (FP1, FP2, FP3, FP4, FP5, GO1, GO2, GO3 channel types)

**Description:** Flood plain and glacial outwash channels are associated with the valley bottom flood plain landform. These two process groups contain low gradient sinuous singular or anabranching channels. Braided channels are more prevalent in the glacial outwash process group. Mountain slope runoff and ground water discharge control stream flow in the flood plain process group while glacial melt controls flow in the glacial outwash group. Peak flows occur in the spring and fall in the flood plain process group while in summer for the glacial outwash group. Sediment deposition is the dominant process in both groups. Substrate material ranges from sand to cobble size material in both groups.

Flood plains commonly support standing old growth spruce with heights of up to 130 feet. Downed wood provides nurse logs for regeneration, sediment retention, and infiltration. Flood plain width may exceed 200 feet on FP4 and FP5 channels, but are generally less than 200 feet on FP3 channels. These areas are typically highly productive for fish. Large wood and off channel rearing areas are of particular significance as habitat features. Early successional forest species, such as black cottonwood, are common in the glacial outwash process group.

**Desired condition:** Flood plains are highly productive as fish and wildlife habitat. Natural flood plain functions occur, such as flood mitigation, surface-groundwater exchange, water temperature moderation and the formation of streams providing off-channel fish habitat. Large wood is distributed across the flood plain, except where non-forest or early successional species naturally occur. Old-growth habitat provides high quality habitat for riparian-associated wildlife species.

**Objectives:** Maintain near-natural quantities of large wood by assessing the site's old-growth type and managing for the natural frequency and size distribution for large, downed wood and standing trees on the flood plain. (Consult "Ecological Definitions for Old-growth Forest Types in Southeast Alaska," Forest Service publication R10-TP-28.) In the stream channel, meet the natural range of aquatic habitat features for large wood size and distribution, pool size and frequency and channel morphometry. (Consult the Alaska Anadromous Fisheries Habitat Assessment, Forest Service publication R10-MB-279, Appendix C.1. on fish habitat objectives).

Minimize soil disturbance and the formation of new channels (BMP 13.9). Maintain fish access to entire range of habitat. Avoid diverting surface drainage channels.

Minimize damage to large standing trees from yarding activities.

Apply the following management direction at the project level to streams in this process group. Complete a watershed analysis before making project site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### Stream class/Activity

#### I, II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. Although not required by the Tongass Timber Reform Act, no commercial timber harvest in the flood plain until the completion of watershed analysis. No programmed commercial timber harvest in the Riparian Management Area (greatest of flood plain, riparian vegetation or soils, riparian associated wetland fens, or 130 feet (the height of one site-potential tree)). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).



## **II (non-direct), III/Timber Harvest**

No programmed commercial timber harvest in the Riparian Management Area (greatest of flood plain, riparian vegetation or soils, riparian associated wetland fens, or 130 feet (the height of one site-potential tree)). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

## **I, II & III/Harvest Controls**

Yard in a manner to minimize baring of mineral soil (<1%) and such that new channelization does not occur across the flood plain. The objective is to minimize alder growth and formation of new channels (BMP 13.9).

## **I, II & III/Roads, Borrow Pits, Drainage Structures**

Locate roads only when other feasible routes do not exist (BMP 14.2). Develop stream course protection plans when stream crossings are necessary. Do not develop borrow pits within the active flood plain (BMP 14.9). The objective is to maintain fish passage and access to all available habitats and avoid diverting surface drainage channels.

## **Process group: High Gradient Contained (HC1, HC2, HC3, HC4, HC5, HC6, HC8 and HC9 channels)**

**Description:** High gradient contained channels are located on mountain slopes. These are singular straight incised channels with steep slopes and channel gradients greater than 6 percent. Stream flow is dependent upon mountain slope runoff and may be intermittent. Sediment is readily transported through these channels. Substrate material ranges from cobble to bedrock. Riparian Management Areas include incised channel sideslopes. Hemlock series dominates vegetation although spruce is also common. Some streams have intermittent flows. Steep gradients (>6%) limit fish capability. Typical site-potential tree height is 120 feet.

**Desired condition:** Natural integrity of channel sideslopes is maintained. Sediment is "metered out" to downstream reaches by large wood structure. Over the long-term, high gradient contained streams act as conduits to move large wood and gravel into downstream fish bearing streams during debris flow events.

**Objectives:** Activities should not accelerate sideslope surface erosion or mass wasting. Maintain some instream large wood structure over the long-term where important for downslope channel processes which require wood as a component of natural debris torrents.

Retain natural drainage patterns and minimize changes to the natural rates of sediment transport.

Design, install, and maintain stream crossings to pass flow, bedload, and wood debris from peak events with minimal impacts to stream channel and road integrity.

Apply the following management direction at the project level to streams in this process group. Complete a watershed analysis before making project site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### **Stream class/Activity**

#### **I, II (direct)/Timber Harvest**

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the Riparian Management Area, defined as within 100 feet of the stream or to the top of the V-notch (side-slope break), whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### **II (non-direct)/Timber Harvest**

No programmed commercial timber harvest within the Riparian Management Area, defined as within 100 feet of the stream or to the top of the V-notch (side-slope break), whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### **III/Timber Harvest**

No programmed commercial timber harvest within the Riparian Management Area, defined as the V-notch (side-slope break). Following watershed analysis, Riparian Management Areas which become available for timber harvest will be converted from nonsuitable to suitable forested lands. (On a forest-wide basis, it is anticipated that this change will occur along 25% of the class III streams in this process group.) Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian

Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

## **I, II & III/Harvest Controls**

Minimize yarding corridors within the Riparian Management Areas.

## **I, II, & III/Roads, Borrow Pits, Drainage Structures**

Borrow pits are generally not appropriate. Road and road crossings should be designed and constructed to minimize soil runoff to the channel, retain natural drainage patterns and minimize changes to the natural rates of sediment transport.



## Process group: Large Contained (LC1 and LC2 channels)

**Description:** Large contained channels are associated with canyons or sloping lowlands. These are low gradient (less than 3 percent), singular, straight and entrenched channels with gravel to bedrock substrate. Sediment regime balances input with output. Stream flow is dependent upon mountain slope or lowland runoff. Habitat is often limited by a scarcity of stable large wood structure. Riparian vegetation communities are varied. Riparian width, including flood plain and sideslope breaks reach 150 feet (LC1) to 190 feet (LC2). A site potential tree reaches an average height of 100 feet.

**Desired condition:** Natural integrity of channel sideslopes is maintained. Large wood is recruited and retained in the stream channel. Riparian vegetation provides shade and is a source of organic inputs to the stream. Old-growth habitat provides high quality habitat for riparian-associated wildlife species.

**Objectives:** Maintain near-natural quantities of large wood by assessing the site's old-growth type and managing for the natural frequency and size distribution for large, downed wood and standing trees. (Consult "Ecological Definitions for Old-growth Forest Types in Southeast Alaska," Forest Service publication R10-TP-28.) In the stream channel, meet the natural range of aquatic habitat features for large wood size and distribution, and pool size and frequency. (Consult the Alaska Anadromous Fisheries Habitat Assessment, Forest Service publication R10-MB-279, Appendix C.1. on fish habitat objectives).

Allow no increase over natural rates of channel sideslope surface erosion or mass wasting.

Minimize changes to the natural rates of sediment transport. Assure fish passage for all Class I & II streams.

Apply the following management direction at the project level to streams in this process group. Complete a watershed analysis before making project site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### Stream class/Activity

#### I and II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the Riparian Management Area, defined as within the channel sideslope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### II (non-direct)/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, defined as within 100 feet of the stream or to the top of the side-slope break, whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### III/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, defined as the side-slope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

## **I & II/Harvest Controls**

Fully suspend trees over the bankfull stream when yarding. Minimize yarding corridors within the Riparian Management Area. Yard in a manner to assure: no delivery of sediment from channel sideslopes; baring of mineral soil is minimized (<1%); and, that new channelization does not occur across the floodplain.

## **I, II & III/Roads, Borrow Pits, Drainage Structures**

Do not develop borrow pits within the active floodplain (BMP 14.9). Where road crossings are required, minimize erosion and sedimentation associated with road crossing approaches within inner gorge. Fish migration should not be impeded by road crossings.

# Standards & Guidelines

## Process group: Moderate Gradient Contained (MC1, MC2 and MC3 channels)

**Description:** Moderate gradient contained channels are associated with sloping or rolling lowlands. Stream gradient ranges from 2 to 6 percent for these singular, straight and entrenched channels. Stream flow is dependent upon mountain slope runoff. Sediment is transported through these channels. Substrate is dominated by cobble, boulder and bedrock material. Habitat is often limited by stable large wood structures. Riparian vegetation communities are varied. Riparian width, including flood plain and sideslope breaks, reach 60 to 70 feet. A site potential tree height is 100 feet.

**Desired condition:** Natural integrity of channel sideslopes is maintained. Large wood is recruited and retained in the stream channel. Riparian vegetation provides shade and is a source of organic inputs to the stream.

**Objectives:** Maintain near-natural quantities of large wood by assessing the site's old-growth type and managing for the natural frequency and size distribution for large, downed wood and standing trees. (Consult "Ecological Definitions for Old-growth Forest Types in Southeast Alaska," Forest Service publication R10-TP-28.) In the stream channel, meet the natural range of aquatic habitat features for large wood size and distribution, and pool size and frequency. (Consult the Alaska Anadromous Fisheries Habitat Assessment, Forest Service publication R10-MB-279, Appendix C.1. on fish habitat objectives).

Allow no increase over natural rates of channel sideslope surface erosion or mass wasting.

Minimize changes to the natural rates of sediment transport. Assure fish passage for all Class I & II streams.

Apply the following management direction at the project level to streams in this process group. Complete a NEPA document that includes a watershed analysis before making site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### Stream class/Activity

#### I and II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the remainder of the Riparian Management Area, defined as within the channel sideslope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### II (non-direct)/Timber Harvest

No programmed commercial timber harvest within 100' or within the channel side-slope break, whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### III/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, defined as the side-slope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).



## **I, II & III/Harvest Controls**

Fully suspend trees over the bankfull stream when yarding. Minimize yarding corridors within the Riparian Management Area. Yard in a manner to minimize delivery of sediment from channel sideslopes.

## **I, II & III/Roads, Borrow Pits, Drainage Structures**

Borrow pits are generally not appropriate. Where road crossings are required, minimize erosion and sedimentation associated with road crossing approaches within inner gorge. Maintain fish passage at road crossings and avoid diverting surface drainage channels.

# Standards & Guidelines

## Process group: Moderate Gradient/Mixed Control (MM1, MM2, and GO4 channels)

**Description:** These channels are commonly found in transition zones between high gradient contained streams and flood plain channels. They are located in narrow valleys, footslopes or sloping and rolling lowlands. Stream channel gradients range from 2 to 6 percent. Channel containment is variable as structural control may be intermittent or only along one bank. Overall channel pattern is straight. Stream flow is dependent upon mountain slope runoff and the sediment regime is balanced (input equals output). Channel substrate ranges from coarse gravel to boulder size material. Typical site potential tree is 120 feet.

**Desired condition:** Large wood is recruited and retained in the stream channel. Riparian vegetation provides shade, is a source of organic inputs to the stream, and maintains dynamic flood plain processes. Large wood is distributed across the flood plain. Old-growth habitat provides high quality habitat for riparian-associated wildlife species.

**Objectives:** Maintain near-natural quantities of large wood by assessing the site's old-growth type and managing for the natural frequency and size distribution for large, downed wood and standing trees. (Consult "Ecological Definitions for Old-growth Forest Types in Southeast Alaska," Forest Service publication R10-TP-28.) In the stream channel, meet the natural range of aquatic habitat features for large wood size and distribution, pool size and frequency and channel morphometry. (Consult the Alaska Anadromous Fisheries Habitat Assessment, Forest Service publication R10-MB-279, Appendix C.1. on fish habitat objectives).

Minimize soil disturbance and the formation of new channels (BMP 13.9). Maintain fish migration where needed and maintain natural surface drainage patterns for flood plain areas.

Apply the following management direction at the project level to streams in this process group. Complete a watershed analysis before making project site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### Stream class/Activity

#### I, II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest in the Riparian Management Area (greatest of flood plain, riparian vegetation or soils, riparian associated wetland fens, or 120 feet (the height of one site-potential tree)). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### II (non-direct), III/Timber Harvest

No programmed commercial timber harvest in the Riparian Management Area (greatest of flood plain, riparian vegetation or soils, riparian associated wetland fens, or 120 feet (the height of one site-potential tree)). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### I, II & III/Harvest Controls

Fully suspend trees over the bankfull width of the stream when yarding. Minimize yarding corridors within the Riparian Management Area. Yard in a manner to assure no barring of mineral soil (<1%) and such that new channelization does not occur across the entire floodplain. The objective is to minimize surface soil disturbance and formation of new channels (BMP 13.9).

## **I,II & III/ Roads, Borrow Pits, Drainage Structures.**

Borrow pits are generally not appropriate. Special road construction techniques may be required to ensure fish passage. Maintain fish migration where needed and avoid diverting surface drainage channels.



## Process group: Palustrine (PA1, PA2, PA3, PA4 and PA5 channels)

**Description:** Palustrine channels are associated with lowland landforms and wetlands. Channel gradients are less than 1 percent. Palustrine channels are singular and sinuous. Stream flow is dependent on peatland and lowland runoff. Sediment storage is the dominant process. Substrate material ranges from fine organic material to coarse gravel.

Riparian vegetation includes mixed conifer, shore pine, and non-forest. Site-potential tree height is generally less than 85 feet.

**Desired condition:** Highly complex stream and riparian systems provide canopy shading, instream organic recruitment for food and cover, and habitat diversity for rearing salmonids. Undercut banks are often present. Old-growth habitat provides high quality habitat for riparian-associated wildlife species.

**Objectives:** Maintain near-natural quantities of large wood (primarily for cover habitat) by assessing the site's vegetation type and managing for the natural frequency and size distribution for large, downed wood and standing trees. (Consult "Ecological Definitions for Old-growth Forest Types in Southeast Alaska," Forest Service publication R10-TP-28.) In the stream channel, meet the natural range of aquatic habitat features for large wood size and distribution, and channel morphometry. (Consult the Alaska Anadromous Fisheries Habitat Assessment, Forest Service publication R10-MB-279, Appendix C.1. on fish habitat objectives).

Maintain streambank structure and wetland functions and values.

Apply the following management direction at the project level to streams in this process group. Complete a watershed analysis before making project site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### Stream class/Activity

#### I & II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest in the Riparian Management Area (greatest of flood plain, riparian vegetation or soils or riparian associated wetland fens). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### II (non-direct)/Timber Harvest

No programmed commercial timber harvest in the Riparian Management Area (greatest of flood plain, riparian vegetation or soils or riparian associated wetland fens). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### III/Timber Harvest

Consider no harvest (or limited harvest) areas to benefit water quality or palustrine-associated wildlife species.

## **I, II & III/Harvest Controls**

Fully suspend trees over the bankfull stream when yarding. Minimize width and number of yarding corridors within the Riparian Management Area. Yard in a manner to minimize delivery of sediment from channel sideslopes. Use wetland guidelines

## **I, II & III/Roads, Borrow Pits, Drainage Structures**

Wetland functions and fish passage receive special attention in locating roads.

## Process group: Lakes and Ponds

**Description:** Lakes and ponds can be located throughout a watershed from near sea level to the alpine. Very high elevation lakes (over 1,000 feet) are often frozen much of the year. Low elevation lakes are often high quality fish rearing habitat, and provide for many species of wildlife (especially beaver, loons, eagles, swans, and other water birds). Lakes and ponds function to mitigate downstream flooding during large precipitation events, and are important for surface-groundwater exchange and moderating water temperatures. Low elevation, fish-abundant lakes, are commonly used for customary and traditional subsistence harvests, sport fishing, and recreational camping. Small ponds, particularly beaver ponds, can be highly productive on a per unit area basis.

Riparian and near-lake vegetation can often be mixed and a mosaic. It can include old-growth forests, hardwoods (e.g., alder or cottonwood), shore pine, and non-forest.

**Desired condition:** Low elevation lakes and ponds provide high quality fish rearing, wildlife habitat, and recreation. In forested areas, adjacent riparian areas provide the lake or pond canopy shading, organic recruitment for food and cover, and habitat diversity for fish. Old-growth habitat surrounding the lakes and ponds provides high quality habitat for lake and riparian-associated wildlife species. Lakes offer scenic diversity and attract recreationists for both consumptive and non-consumptive pursuits.

**Objectives:** In forested areas, maintain near-natural quantities of large wood for near-shore lake habitat and for lake and riparian-associated wildlife.

Maintain lake shore character, including vegetation, bank conditions, and near-shore substrate (except occasionally for localized areas developed for recreation or other conforming uses); maintain hydrologic and wetland function and values.

(Note: since lakes and ponds are so variable in their physical and biological characteristics, additional objectives should be set on a project basis.)

Apply the following management direction at the project level to lakes in this process group. Complete a watershed analysis before making project site-specific adjustments to Process group direction. Adjustments to the direction may be made only if the objectives of the process group can be met.

### Lake Class/Activity

#### **I (lakes with anadromous fish or with high value resident fisheries) and II (lakes with lower value resident fisheries; lakes $\geq$ 3 acres) /Timber Harvest**

No programmed commercial timber harvest within 100 horizontal feet of the lake margin or within the Riparian Management Area (greatest of the riparian vegetation or soils, riparian associated wetland fens, or the height of one-site potential tree (to be determined at the project level)). Consider an additional no harvest (or limited harvest) area beyond the no programmed commercial timber harvest area to benefit lake-associated scenic quality, wildlife species (e.g., spotted frogs, Vancouver Canada geese, tree nesting ducks), and recreation, subsistence, and visitor uses. Typically larger lakes in lesser development LUD's with higher resource values should have wider additional buffers than smaller lakes in the more highly developed LUD's with lower resource values. Manage an appropriate distance beyond any no-harvest zone to provide for a reasonable assurance of windfirmness of the desired standing timber (pay special attention to the area within one site-potential tree height of the no-harvest zone).



## **II (lakes with lower value resident fisheries; lakes < 3 acres), III/Timber Harvest**

Consider no harvest (or limited harvest) areas to benefit lake-associated scenic quality, wildlife species and recreation, subsistence, and tourism uses.

## **I & II Harvest Controls**

Yard in a manner to minimize baring of mineral soil (<1%) and such that new channelization does not occur in areas that would drain into a lake, pond or wetland.

## **I, II, & III/Roads, Borrow Pits, Drainage Structures, Facilities**

Special attention shall be given to wetland/riparian functions and values. Normally, locate roads and borrow pits outside the no programmed commercial timber harvest area. Roads, trails and other facilities which are dependent on, or make specific use of, the lake or pond may be located to the lake edge.



# **Appendix D**

## **Biological Assessment and Biological Evaluation**



# Appendix D

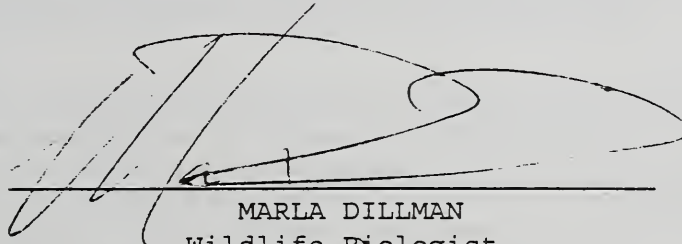
Biological  
Assessment and  
Monitoring  
Evaluation

BIOLOGICAL ASSESSMENT and BIOLOGICAL EVALUATION

FOR THE CHASINA PROJECT AREA

UNITED STATES DEPARTMENT OF AGRICULTURE  
TONGASS NATIONAL FOREST  
KETCHIKAN AREA

PREPARED BY:

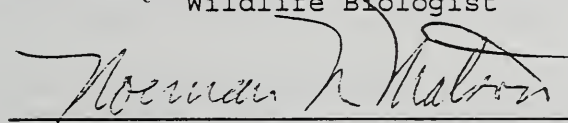


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# BIOLOGICAL ASSESSMENT and BIOLOGICAL EVALUATION for the Chasina Project Area

December 1997

This combined Biological Assessment and Biological Evaluation was prepared for the Chasina Project Area as required by Section 7 of the Endangered Species Act (as amended) and the USDA Forest Service threatened, endangered, and sensitive plant and animal species policy (FSM 2670). This document describes the occurrence of and project effects on species that are Federally listed or proposed for threatened or endangered status. Although not required, USFWS species of concern and sensitive plant and animal species within the Project Area are also addressed. This document also serves as a BE by including equivalent information on Forest Service-listed sensitive species. The BE is not required under the ESA, but is required by the Forest Service for all internal programs and activities (FSM 2672.4).

An Environmental Impact Statement is being prepared for the Chasina Project Area. The Chasina Project Area includes 68,927 acres, and is approximately 25 air miles southwest of Ketchikan, Alaska. It encompasses an area of southern Prince of Wales Island, from the West Arm of Cholmondeley Sound east to include all of Chasina Point. The Project Area includes Wildlife Analysis Areas (WAA's) 1210, 1211, and 1213. The action includes the harvest of approximately 990 to 2,550 acres of old-growth forest, construction of 12-64 miles of new roads, the use of one existing log transfer facility, and the construction of one new log transfer facility.

This BA/BE addresses a total of 31 plant and animal species. It covers the endangered humpback whale (*Megaptera novaeangliae*), American peregrine falcon (*Falco peregrinus anatum*), and the Eskimo curlew (*Numenius borealis*); the threatened Aleutian Canada goose (*Branta canadensis leucopareia*), and Steller sea lion (*Eumetopias jubata*); one frog, one fish, four plant, and six bird species that are USFWS Species of Concern. It also includes three bird species (one species of bird, the Queen Charlotte Goshawk, is on both the USFWS species of concern list and the USDA FS sensitive species list), and 13 plant species (one of which is also on both the USFWS species of concern and the USDA FS sensitive species list) on the Forest Service Region 10 sensitive species list, but are not listed as endangered, threatened or species of concern under the Endangered Species Act. Both the Queen Charlotte goshawk and the goose-grass sedge are discussed only once even though they appear on two lists. One other species of bird, the Prince of Wales spruce grouse is also discussed in this document even though it does not appear on any list. It is a species of special concern of the Alaska Department of Fish and Game. There are other species which are on these lists as well but they are not included in this document as they are not known or suspected to occur in the Ketchikan Area.

## I. IDENTIFICATION OF ENDANGERED AND THREATENED SPECIES AND/OR CRITICAL HABITATS FOR SUCH SPECIES WITHIN THE PROJECT AREA.

### A. Federal Threatened and Endangered Species, and FWS Species of Concern

Federally listed threatened and endangered species are those plants and animal species formally listed by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS), under the authority of the Endangered Species Act of 1973, as amended. An endangered species is defined as one which is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as one which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Species of Concern are species for which the USFWS remains concerned about the long-term viability of the species, and the potential for listing as threatened or endangered still remains.

Species listed as endangered or threatened are provided statutory protection under the Endangered Species Act of 1973, as amended; species of concern are not. Therefore, under the Endangered Species Act, agencies technically have no legal obligation to take action on species of concern. Although the USFWS and NMFS do not have legal authority to regulate management of National Forest lands for species of concern, the Forest Service has agreed to coordinate closely

with the USFWS and NMFS in an effort to prevent species of concern declining to where they need to be listed as threatened or endangered (Memorandum of Understanding January 25, 1994).

The State of Alaska has an Endangered Species Law which authorizes the Commissioner of the Alaska Department of Fish and Game (ADF&G) to list Alaska threatened and endangered species and species of concern.

Table D-1 summarizes the threatened, endangered, and species of concern, and sensitive species of plants and animals occurring on or near the Chasina Project Area. These are addressed in this Biological Assessment and Biological Evaluation.

Table D-1

**Status\*\* of Threatened, Endangered, and Species of Concern Occurring On or Near the Chasina Project Area with Summary BA/BE Finding.**

| SPECIES                             | STATUS |    |       | BA/BE FINDING         |
|-------------------------------------|--------|----|-------|-----------------------|
|                                     | USFWS  | FS | STATE |                       |
| Mammals                             |        |    |       |                       |
| Humpback whale                      | E      |    | E     | Not..Adversly Effect* |
| Steller sea Lion                    | T      |    |       | Not...Adversly Effect |
| Alexander Archipelago wolf          | C      |    |       | May Effect -          |
| Birds                               |        |    |       |                       |
| American Peregrine falcon           | E      |    | E     | Not...Adversly Effect |
| Arctic Peregrine falcon             | C      |    | E     | Not...Adversly Effect |
| Aleutian Canada goose               | T      |    | E     | Not...Adversly Effect |
| Trumpeter swan                      |        | S  |       | No Effect             |
| Eskimo curlew                       | E      |    | E     | Not...Adversly Effect |
| Marbled Murrelet                    | C      |    |       | May Effect -          |
| Kittlitz's murrelet                 | C      |    |       | No Effect             |
| Osprey                              |        | S  |       | No Effect             |
| Prince of Wales spruce grouse       |        |    |       | No Effect             |
| Queen Charlotte Goshawk             | C      | S  |       | May Effect -          |
| Harlequin Duck                      | C      |    |       | No Effect             |
| Olive-sided flycatcher              | C      |    |       | May Effect +          |
| Amphibian                           |        |    |       |                       |
| Spotted Frog                        | C      |    |       | No Effect             |
| Fish                                |        |    |       |                       |
| Bull Trout                          | C      |    |       | No Effect             |
| Plants                              |        |    |       |                       |
| Aster yukonensis                    | C      |    |       | No Effect             |
| Calamagrostis crassiglumis          | C      |    |       | No Effect             |
| Carex lenticularis var. dolia       | C      | S  |       | No Effect             |
| Montia bostockii                    | C      |    |       | No Effect             |
| Cirsium edule                       |        | S  |       | No Effect             |
| Glyceria leptostachya               |        | S  |       | No Effect             |
| Hymenophyllum wrightii              |        | S  |       | No Effect             |
| Isoetes truncata                    |        | S  |       | No Effect             |
| Ligusticum calderi                  |        | S  |       | No Effect             |
| Platanthera chorisianna             |        | S  |       | May Effect -          |
| Platanthera gracilis                |        | S  |       | No Effect             |
| Poa laxiflora                       |        | S  |       | No Effect             |
| Rannunculus orthorhynchus           |        |    |       |                       |
| var. alaschensis                    |        | S  |       | No Effect             |
| Senecio moresbiensis                |        | S  |       | No Effect             |
| Romanzoffia unalaschensis           |        | S  |       | No Effect             |
| Proposed Sensitive Species:         |        |    |       |                       |
| Salix reticulata ssp. glabellicarpa |        | S  |       | No Effect             |

\*\* E = Endangered, Federal or State; T = Threatened, Federal; C = Species of Concern, Federal; S = Sensitive, FS Region 10. \*Not likely to adversely effect; -/+ indicate a negative/positive effect



There has been no critical habitat officially designated for any of these species at this time in Southeast Alaska, except for specific rookery, mating and pupping, and haulout locations for Steller sea lions (CFR part 226, August 27, 1993).

The USFWS, in a recent letter responding to the NOI for the Chasina Project, has identified Queen Charlotte goshawk, Alexander Archipelago wolf, a subspecies of the gray wolf (Goldman 1937, Pedersen 1983), harlequin duck, olive-sided flycatcher and marbled and Kittlitz's murrelet as being species of concern that may be affected by the proposed project.

The endangered American peregrine falcon may migrate through the Project Area, as may the Eskimo curlew, and the Aleutian Canada goose. The harlequin duck and the Steller sea lion occurs in the adjacent saltwater. There has been no evidence of the existence of any other listed species within the Project Area.

The humpback whale (*Megaptera novaeangliae*) and Steller sea lion (*Eumetopias jubata*) were listed by the National Marine Fisheries Service (NMFS) in an assessment of the Project Area (Pennoyer February 6, 1992). During 1991, NMFS completed final recovery plans for the humpback whales. The Steller (northern) sea lion is currently listed as threatened for the eastern population and threatened for the western population (NOAA and NMFS; 50 CFR parts 222 and 227; effective date 4 June 1997).

No plant species that has been listed as threatened or endangered in the state of Alaska is known or suspected to occur to within the Chasina Project Area. Two Forest Service listed sensitive species were found within the project boundary- Choris bog orchid (*Platanthera Chorisiana*), and the staight-beaked buttercup (*Ranunculus orthorhynchus* var. *alaschensis*).

No fish species known to occur in the Project Area have been determined to be threatened, endangered, or sensitive.

## II. THREATENED/ENDANGERED SPECIES ASSESSMENTS

### HUMPBACK WHALE (*Megaptera novaeangliae*)

#### Distribution and Population

Humpback whales are the most abundant of the eight species of endangered whales that occur in Southeast Alaska waters. Their population in the North Pacific is about 1,200, which is about eight percent of the prewhaling population. These whales are regularly sighted in the Inside Passage and coastal waters of the Southeast Alaska panhandle from Yakutat Bay south to Queen Charlotte Sound. Humpback whales feed in Southeast Alaskan panhandle waters from about May through December, although they have been seen in every month of the year. Peak numbers of whales are usually found in nearshore waters during late August and September, but substantial numbers remain until early winter. Baker et al. (1985) estimate that 300-350 humpback whales inhabit Southeast Alaska during the summer and fall.

The local distribution of humpbacks in Southeast Alaska appears to be correlated with the density and seasonal availability of prey, particularly herring (*Clupea harengus*) and euphausiids. Important feeding areas include Glacier Bay and adjacent portions of Icy Strait, Stephens Passage/Frederick Sound, Seymour Canal and Sitka Sound. Glacier Bay and Icy Strait appear to be an important feeding area early in the season, when whales prey heavily on herring and other small, schooling fishes. Frederick Sound is important later in summer, when whales feed on swarming euphausiids. During autumn and early winter, humpbacks move out of the Sound to areas where herring are abundant, particularly Seymour Canal. Other areas of Southeast Alaska may also be important for humpbacks and need to be evaluated. These include: Cape Fairweather, Lynn Canal, Sumner Strait, Dixon Entrance, the west coast of Prince of Wales Island and offshore banks such as the Fairweather Grounds.

Because the humpback inhabits shallow coastal areas, it is increasingly exposed to human activity. Consequently, these whales may be more susceptible to confrontational disturbance, displacement, and loss of habitat from environmental degradation than some other whale species.

Humpbacks summering in Southeast Alaska have been linked to three different wintering areas in Mexico, Hawaii, and Asia.

## Effects of Chasina Proposed Actions on Population or Habitat

Most of the information and data for whales in Southeast Alaska are associated with one species, the humpback whale, because it is the most abundant whale to occur in Southeast Alaska waters. The other seven species of whales are either present only seasonally as they migrate along the outer coastal areas, or are only occasionally found in the inside coastal waters of Southeast Alaska. The following discussion and analysis is primarily based on humpback whales, but is assumed to be applicable to the other species of whales.

The recovery plans for the humpback whale identified six known or potential categories of human impacts to these species: hunting, entrapment and entanglement in fishing gear, collisions with ships, acoustic disturbance, habitat degradation, and competition for resources with humans.

National Forest management activities which may have an effect on whale habitats or populations generally fall into the categories of acoustic disturbance and habitat degradation. These management activities include: the development and use of log transfer facilities (LTF's) and their associated camps, the movement of log rafts from log transfer facilities to mills, and the potential development of other docks and associated facilities for mining, recreation, and other forest uses and activities. Generally, with the development and use of LTF's and other docking facilities for projects, there is an associated increase in recreational boating in the immediate vicinity during the construction and use of the facilities.

Construction and operation of LTF's and other docking facilities are restricted to small, very localized areas of the marine environment. There is one LTF currently on National Forest System lands within the Chasina Project. This LTF is in Lancaster Cove. An estimated 2 acres of marine benthic disturbance associated with this existing LTF's could occur as a result of bark deposition. There are also LTF's on Kootznoowoo Inc. lands at Dora Bay and Port Johnson. One additional LTF is proposed for construction in Cannery Creek under various alternatives of the Chasina Project. The site has been checked by USFWS biologists and has been found to be suitable for LTF development.

There is little potential to directly affect whales with these facilities. During the summer of 1989, there was one report of a humpback whale entangled in some cables at an inactive LTF site on the Stikine Area. This is the only known direct effect incident involving whales related to LTF's.

Two potential indirect effects of LTF's and other docking facilities and associated activities have been identified: 1) effects on whale prey species, and 2) disturbances of whales by boat traffic associated with LTF's.

*Effects on Prey.* Nemoto (1970) noted that euphausiids and gregarious fish are the primary prey of humpbacks. Thirteen species of fish and 57 species of invertebrates were identified as humpback whale prey in Southeast Alaska. Humpbacks studied in Glacier Bay and Stephens Passage-Frederick Sound were found most frequently in areas of high prey density (Wing and Krieger 1983).

Construction and operation of all LTF's and similar facilities require U.S. Army Corps of Engineer, U.S. Environmental Protection Agency permits, and State of Alaska tidelands permits. The permitting process provides that construction and operation will maintain water quality in the specific facility locations, and that marine circulation and flushing will be maintained as well. All facilities must be in conformance with permit standards. Although the effects may vary locally, the major effect of leachates (ie. terpene, alpha-conindentric acid, alpha-conindentrin, hydroxymatairesinol, linoletic acid, and dehydroabientic acid) from stored log rafts, is upon invertebrates.

Crustaceans, shrimp, and crab larvae seem especially sensitive (Pease 1973, Buchanan and Tate 1976). EPA measuring techniques may be required to monitor the LC50 levels at each LTF (Peltier and Weber 1985) in order to insure impacts are limited to the approved "zone of deposit".

*Effects from Disturbance.* Humpback whale response to nearby boating activity varies from no apparent response to pod dispersal, sounding, breaching, evasive underwater maneuvers, and maintaining distance (Baker and Herman 1983, Baker et. al. 1982). Disturbance by boat activity has been suggested as one of the possible causes of observed changes in whale distribution in Southeast Alaska. Direct pursuit of whales by boats, and frequent changes in boat speed and direction appear to elicit avoidance behaviors more frequently than other types of boat traffic. However, whales may readily habituate to constant and familiar noise (Norris and Reeves 1978). Whales can be commonly found in some areas of Southeast Alaska which have considerable boat traffic. Whether they are habituated to boat traffic or not has not yet been documented. Adverse effects from current levels of boat traffic have not yet been documented.



Two basic types of boat activity associated with LTF's are log raft towing and recreational boating by workers. Log raft towing frequency would vary between camps, seasons, and years, with an average of about once a week during the working season (U.S.D.A. Forest Service 1989). Tug boats maintain relatively constant speeds and directions during log raft towing; constant speed and direction elicit less avoidance behavior from whales than other types of boating activity. Log raft towing routes are generally well established, but adverse effects from log raft towing have not been documented.

Recreational boating activity by camp residents would vary between seasons, years, and camps of different sizes. This activity would be concentrated near LTF sites, other docking facilities, and camps. It is estimated that most recreational boating would occur within a few miles of the site, few trips would be made over 10 miles, and activity greater than 30 miles from a site would be negligible. This boating would involve frequent changes in speed and direction and may include some small amount of whale pursuit, if the whales are within sight of the camp or an occupied boat. The effect of such recreational activity on whales would depend on many factors such as size of the bay, depth of the waters in the bay, number of boats, individual behavior responses of the whales, etc. At the present time, there is not a quantifiable way to estimate these possible effects.

The following Forest-wide standards and guidelines have been developed for application on all Forest Service permitted or approved activities and will be incorporated into the Chasina EIS from the 1997 Tongass Land Management Plan by reference:

Provide for the protection and maintenance of whale habitats:

1. Avoid intentional aircraft flights below 500 feet above ground level in the known vicinity of whales on Forest Service permitted or approved activities, when weather ceilings permit.
2. Avoid intentional approach in a vessel of 100 feet or more in length to within 1/4 mile of whales on Forest Service permitted or approved activities, when safe passage exists.
3. Avoid intentional approach in a vessel of less than 100 feet in length to within 100 yards of whales on Forest Service permitted or approved activities, when safe passage exists.

No adverse effects on whales from implementation of Forest management activities are anticipated. Indirect effects may be associated with possible increased boating activity, but are mitigated by Forest Service and NMFS standard and Guidelines

## STELLER SEA LION (*Eumetopias jubata*)

### Distribution and Population

The Steller (northern) sea lion ranges from Hokkaido, Japan, through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, Gulf of Alaska, Southeast Alaska, and south to central California. There is sufficient information to consider animals in different geographic regions as separate populations. The Steller sea lion is currently divided into two different populations. The western population, which ranges west of Cape Suckling Alaska, is listed as endangered. The eastern population, which occurs in Southeast Alaska, is listed as threatened (NOAA and NMFS; 50 CFR parts 222 and 227; effective date 4 June 1997).

The number of sea lions observed on certain rookeries from Kenai Peninsula to Kiska Island declined by 63 percent since 1985 and by 82 percent since 1960. Significant declines have also occurred on the Kuril Islands. Information on trends in the population of sea lions in Southeast Alaska is sketchy, but what data does exist suggests that Southeast Alaska populations are stable or perhaps slightly decreasing.

The cause of overall population declines has not been confirmed. However, incidental mortality of sea lions in commercial fishing gear, shooting by fishermen, and reduced prey species due to commercial fishing operations have probably contributed significantly to declines (Reeves et al. 1992).



When the sea lion was given emergency listing as a threatened species in the Federal Register (April 5, 1990), buffer zones restricting human activities were established around rookeries for the western population. The closest Steller sea lion rookery to the Chasina Project Area is on Forrester Island, west of Prince of Wales Island. Sea lion haulouts used for sunning and resting occur on Grindall Island, on the south tip of Kasaan Peninsula and Cape Addington on Noyes Island. These areas are not designated as critical habitat. A recovery team has prepared a draft recovery plan for the Steller sea lion.

Important food resources include walleye pollock, salmon, eulachon, and cephalopod mollusks. Steller sea lions forage predominantly in nearshore areas and over the continental shelf.

### **Effects of Chasina Proposed Actions on Population or Habitat**

The NMFS provides a summary of factors affecting the Steller sea lion (Federal Register April 5, 1991). These factors include reductions in the availability of food resources, especially pollock, which is the most important prey species for sea lions; commercial harvests of sea lion pups; harvests for subsistence and for public display and scientific research purposes; predation by sharks, killer whales, and brown bear; disease; the inadequacy of existing regulations regarding quotas on the incidental harvesting of sea lions during commercial fishing operations; other natural or human incidences such as shooting adult sea lions at rookeries, haulout sites, and in the water near boats. None of these factors are regulated by or within the jurisdiction of the Forest Service.

Southeast Alaska populations of Steller sea lions have not declined to the extent that other populations have. Harassment or displacement of sea lions from preferred habitats by human activities such as boating, recreation, aircraft, log transfer facilities, log raft towing, etc., is a concern with regard to long-term conservation of the sea lion in Southeast Alaska. Forest-wide standards and guidelines direct the Forest Service to prevent and/or reduce potential harassment of sea lions and other marine mammals due to activities carried out by or under the jurisdiction of the Forest Service (TLMP 1997). The sea lion standards and guidelines can be found in the TES section of this document.

No direct effects on sea lions from Forest management activities are anticipated. Compliance with these standards and guidelines will result in no anticipated adverse effects on sea lion populations or their habitats for any of the alternatives

## **AMERICAN PEREGRINE FALCON (*Falco peregrinus anatum*)**

### **Distribution and Population**

The American peregrine falcon is primarily associated with interior Alaska for breeding, nesting and rearing of young. This falcon is highly migratory, wintering as far south as northern Argentina and occurring in Southeast Alaska only during migration periods (Ambrose, et al., 1988). Reproduction has increased population numbers three-fold in Alaska (ADF&G letter Feb. 6, 1987, Ambrose, et al., 1988, minutes of Interagency Wildlife Technical Committee Meeting of March 29, 1991). Population numbers of the American peregrine falcon are continuing to increase (ADF&G letter dated February 6, 1987; Ambrose et al. 1988).

### **Effects of Chasina Proposed Action on Population or Habitat**

The primary reason for past declines in peregrine falcon populations was the proliferation of organochlorine pesticides, especially DDT and its principal metabolite DDE (Ratcliff 1969; Peskall 1976; Cade et al. 1971; Peskall and Kiff 1979; USFWS 1982). No organochlorine pesticides are authorized for use on the Tongass National Forest.

During migration through Southeast Alaska, the availability and abundance of prey species will most likely be the primary habitat factor affecting American peregrine falcons. In coastal areas of Washington, the primary prey species for peregrine falcons were shorebirds and waterfowl species; passerine birds were also identified in the diet (Anderson and Debruyne 1979; Anderson et al. 1980). It is assumed that food sources would be similar for peregrine in coastal Alaska. Peregrines forage over open sites such as over bodies of water, marshes, grasslands, and shorelines, as well as above wooded areas. They attack flying prey from above or by chasing them. Although peregrines forage over wide areas, they do have preferred foraging sites (White 1974).

Actual migration routes and patterns, and foraging areas, have not been identified for this subspecies of peregrine in Southeast Alaska. Forest-wide standards and guidelines have been developed for protecting seabird rookeries and waterfowl concentration areas (TLMP 1997). A wide variety of passerine, perching and song, birds will be available from numerous open and forested communities under all alternatives associated with the Chasina Project.

No adverse effects on American peregrine falcon populations or their habitats are anticipated with any Forest management activities under any of the alternatives for this project.

## **ALEUTIAN CANADA GOOSE (*Branta canadensis leucopareia*)**

### **Distribution and Population**

The breeding, nesting, and rearing of young Aleutian Canada geese is primarily associated with the Aleutian Islands. The Aleutian Canada goose winters in western Oregon, and in northwestern and central California. Although their movements within Alaska are not well known, the Aleutian Canada goose may occur in Southeast Alaska during migration. Population numbers in Alaska are increasing, and the USFWS is considering removing the species from the threatened list.

### **Effects of Chasina Proposed Action on Population or Habitat**

The Aleutian Canada goose is not primarily associated with Southeast Alaska. Although migration patterns in Alaska are not well known, Aleutian Canada geese may occur in Southeast Alaska as migrants. Any migrating geese stopping over on Prince of Wales Island would likely be found resting in central wetland areas. Due to the limited use of the Project Area by Aleutian Canada geese, no adverse effects on their population by any of the alternatives is anticipated.

## **ESKIMO CURLEW (*Numenius borealis*)**

### **Distribution and Population**

The Eskimo curlew is primarily associated with western and northern Alaska. The Eskimo curlew is rare and not typically found in Southeast Alaska, but it may occur as a migrant.

### **Effects of Chasina Proposed Action on Population or Habitat**

Due to the limited use of the Project Area by the Eskimo curlew, no adverse effects on their population by any of the alternatives is anticipated.

## **III. SPECIES of CONCERN ASSESSMENTS**

### **ALEXANDER ARCHIPELAGO WOLF (*Canis lupus ligoni*)**

#### **Taxonomic Status and Range**

The Alexander Archipelago wolf is a small subspecies of the gray wolf (Goldman 1937, Pedersen 1983), similar in appearance to the Vancouver Island wolf (*C.l. crassodon*). Kirchhoff (1992) described the Alexander Archipelago wolf as occurring on the Southeast Alaska mainland and all large island in Southeast Alaska except for Admiralty, Baranof, and Chichagof.

On December 17, 1993, the USFWS received a petition from the Biodiversity Legal Foundation to list the Alexander Archipelago wolf of Southeast Alaska as threatened pursuant to the Endangered Species Act. On May 13, 1994, the



USFWS found that the petitioners had presented substantial information indicating that listing may be warranted and a status review of the species was initiated. On August 28, 1997, the USFWS found that listing the Alexander Archipelago wolf as threatened is not warranted.

The primary food of most Southeast Alaskan wolves is deer (Person et al. 1996). Beaver, mountain goat, and moose are also primary prey in some mainland areas. Spawning salmon are fed on when available (Wood 1990). Alexander Archipelago wolf abundance is likely linked to deer abundance and availability, particularly in southern island habitats (Suring et al. 1988, Wood 1990, Person et al. 1996).

Based on field observations, discussions with trappers and anecdotal information, the wolf population in Southeast Alaska is estimated to be 635 to 690 individuals, distributed in 85 packs (Morgan 1990). However, Person (et al. 1996) estimated that the current Southeast population was slightly over 900 individuals and that 250-300 of them occupied Prince of Wales Island.

Many studies have shown that wolf abundance may be correlated with road density (Theil 1985, Jensen et al. 1986, Mech et al. 1988, Fuller 1989). In one study, wolves generally were not present where the density of roads used by humans exceeded 0.93 mi/sq mi (0.58 km/sq km) (Mech et al. 1988). However, other work has suggested that wolves could exist in areas with higher densities if these areas were adjacent to roadless areas (Mech et al. 1988). The primary threat of high road densities is the increased access by humans who kill wolves by shooting, snaring, or trapping (Van Ballenberghe et al. 1975, Mech 1977). On Prince of Wales Island and Kosiushko Island, hunting and trapping mortality doubled where the length of road in a WAA exceeded 59 miles or about .7 miles per square mile (Person et al. 1996).

Based on application of the Tongass Habitat Capability Model for the gray wolf (see Chasina FEIS), habitat capability declined by about 16% in the Project Area between pre-logging and existing conditions. This decline is directly related to a reduction in deer habitat capability associated with conversion of old-growth forest to young second growth. Accompanying this decline has been an increase in road density associated with logging activities. Road density under existing conditions is approximately 1.6 mi/sq mi across the Project Area when including Private and State ownership, and .34 mi/sq mi when only considering roads on National Forest System lands. For a more thorough discussion of the Alexander Archipelago wolf, especially in relation to forest management and roads, see the conservation assessment of Persons et al. (1996) as well as the 1997 TLMP p. 3-355, 356 and 399-406.

## **Effects of Chasina Proposed Action on Population or Habitat**

Implementation of any of the Chasina Project action alternatives will result in a reduction in deer habitat capability. Wolf habitat capability is predicted to be reduced in proportion to the reduction in deer habitat capability. The wolf habitat capability reduction is predicted to range from 3 percent for Alternative 2 to 10 percent for Alternative 6, and 6 percent for Alternatives 3, 4 and 5 (see Table WIL-15 in the wildlife section of the FEIS).

Road densities will also increase in the Project Area as a result of implementation of any of the action alternatives. Total road density, when considering National Forest Service Lands only, would range from 0.46 mi/sq mi for Alternative 2 and 1.3 mi/sq mi for Alternative 6 after implementation. When considering all lands within the Project Area the road density climbs to 2.06 mi/sq mi for alternative 2 and 2.9 mi/sq mi in alternative 6. Both of these road densities are well above the recommended road densities of .7 mi/sq.mi by Person et al. 1996 and the .93 mi/sq.mi recommended by Mech et al. 1977. When just considering the Forest Service lands that road densities are within the recommended amounts for alternative 2. However, the effect of increased road density would be mitigated by access management and the fact that the road system in the Project Area is not connected to a population center (not connected to a road system to Craig, Thorne Bay, Hydaburg etc.).

Because of the reduction in deer habitat capability and the increase in road density associated with implementation of any of the action alternatives, the Chasina Project may affect the Alexander Archipelago wolf. If a wolf den is discovered within the Chasina Project Area the appropriate standards and guidelines from the 1997 TLMP will be followed.

See the Roads and Transportation Section of the FEIS or the road cards for the complete access management plan for the roads in the Chasina Project.



## ARTIC PEREGRINE FALCON (*Falco peregrinus tundris*)

### Distribution and Population

The Artic peregrine falcon is primarily associated with the area north of the Brooks Range and Seward Peninsula; it is highly migratory, wintering as far south as northern Argentina (Ambrose et al. 1988). It occurs in Southeast Alaska only during migration periods. Population numbers have increased three-fold in Alaska (ADF&G letter Feb. 1987; Ambrose et al. 1988; minutes of Interagency Wildlife Technical Committee Meeting of March 20, 1991).

### Effects of Chasina Proposed Action on Population or Habitat

As described for the American peregrine falcon, no effects on the population or habitat of the Arctic peregrine falcon are anticipated from any of the Chasina action alternatives.

## MARBLED MURRELET (*Brachyramphus marmoratus* ssp. *marmortus*)

The marbled murrelet is a small seabird that belongs to the family Alcidae. The North American subspecies (*B. m. marmoratus*) ranges from the Bering Sea, eastward to Cook Inlet, Kodiak Island, Kenai Peninsula, and Prince William Sound, southward coastally throughout the Alexander Archipelago of Alaska and through British Columbia, Washington, Oregon to central California, with individuals wintering as far south as southern California (Marshall 1988, USFWS 1992, Ralph et al. 1995). The species feeds below the water's surface on small fish and invertebrates in near-shore marine waters (Marshall 1988, USFWS 1992).

Marbled murrelets nest on land or in trees and lay only one egg. They are semi-colonial in their nesting habitats; nesting marbled murrelets are often aggregated (USFWS 1992). Alaska is the only state where marbled murrelets are known to nest on the ground primarily in treeless areas. Of the 33 marbled murrelet nests found in Alaska 14 were ground nests, and 19 were in trees (DeGrange 1996). Of 47 nests found in British Columbia, Washington, Oregon and California where data is available, all were located in old-growth trees that ranged in diameter at breast height from 35 inches to 210 inches. Nest trees located in Alaska ranged from 12 to 41 inches DBH (Hamer and Nelson et al. 1995). Nests were located high above the ground and usually had good overhead protection (USFWS 1992). Both males and females incubate the eggs; one bird stays at the nest for 24 hours, while the other is feeding on the ocean. After hatching their young, the adults stay at the nest with the young bird for only about four days. After that, the young bird is left alone in the nest, except when the adults return to the nest to feed it (Nelson and Hamer in Ralph et al. 1995).

Except for the fall period when they are molting, and as a result flightless and stay on the ocean, murrelets have been known to fly to tree stands every month of the year. In Washington, birds have been recorded up to 50 miles inland (Hamer and Cummins 1991, in USFWS 1992).

Overview of work in Alaska. An upland study of marbled murrelets was conducted on Naked Island in Prince William Sound. In the study area, murrelets flew most frequently into two areas with steep slopes facing west, and 70-80% cover of hemlock old-growth. A cursory review of the small sample suggested greater murrelet use of inland areas at the heads of bays as opposed to the outer peninsulas (Kuletz 1991).

Features common to all six Southeast Alaska nests include relatively low elevation, relatively close proximity to salt water (especially compared to nests in other states), location in uneven-aged old-growth stands of conifers, and use of moss as a nesting substrate. Significantly, all tree nests were located in larger diameter than most of the surrounding trees and in trees of declining health, suggesting old age (Aglar et al. 1995).

Marbled murrelets are common along the coast of the Project Area. Boat transect surveys were conducted along the shoreline of logged and unlogged areas by the Craig and Misty Fiords Ranger Districts in 1991; these surveys counted 7.5 and 10 marbled murrelets per kilometer traveled parallel to the shoreline in transects 200 meters wide respectively. Assuming that marbled murrelets along the Prince of Wales Island coast nest within the Chasina Project Area, and assuming a conservative estimate of seven marbled murrelets per kilometer of shoreline for the Project Area, then Chasina (270 km of shoreline) might provide habitat for 1,890 marbled murrelets. This figure is likely low, because the Craig and Misty survey figures were for 200 meter wide transects, not for all distances out from the shoreline. The estimate for Chasina assumes that the figure from the survey vicinity can be extrapolated to Chasina and that birds nest

in the general vicinity of where they are seen at sea. Agler et al. (1995) demonstrated that the marbled murrelet is the most abundant seabird in Southeast Alaska, at 434,000 (+ 167,000) individuals at sea during June and July.

On 22 July 1992, marbled murrelet at-sea surveys were conducted in the Project Area (Lancaster Cove, Kitkun Bay, and Dora Bay). The number of murrelets surveyed were 255 in Lancaster Cove (8 km), 31 in Kitkun Bay (6.5 km) and 80 in Dora Bay (8 km), which averaged 16.5 murrelets/km of survey. In 1995 morning counts were conducted from the Tongass Ranger boat while anchored in McLean Arm and Hunter Bay (SW Prince of Wales Island, approximately 20 south of Project Area). The morning of 14 July, 23 birds were counted in McLean Arm and on 15 July, 44 marbled murrelets were counted in Hunter Bay.

Old growth removal is not the only factor which may be influencing murrelet populations; other known factors include oil spills, predation, and commercial fishing (murrelets are caught in fishing nets).

## **Effects of Chasina Proposed Action on Population or Habitat**

No actual nest sites for marbled murrelets were identified within the Project Area, although no nest searches were performed. It is assumed that much of the old-growth forest within the Project Area is suitable nesting habitat, as suggested by the presence of marbled murrelets inland and at sea during the breeding season as well as the eggshell fragments that were found at two locations within the Chasina Project during the 1995 field season.

Since all inland forest stands on the Tongass National Forest are less than 25 miles from salt water, all could be potential marbled murrelet nesting habitat (USDI Fish and Wildlife Service 1992). However, these birds more commonly occupy larger stands (greater than 500 acres) than smaller stands (less than 100 acres) in California; marbled murrelets are usually absent from stands less than 60 acres in size (Paton and Ralph 1988, Ralph et al. 1990). Without precise knowledge to delineate the differences, all old-growth habitat greater than 8 MBF/acre is assumed to be suitable for nesting. See the Old Growth and Biodiversity Section of the FEIS for more information on the patch-size acreage by alternative.

All action alternatives will harvest stands which may be capable of providing nesting habitat (old-growth forests) for marbled murrelets. Table 2 shows that Alternative 2 harvests 4 percent, Alternative 3 harvests 7 percent, Alternatives 4 harvests 7 percent, alternative 5 harvests 6 percent, and Alternative 6 harvests 10 percent of the old-growth habitat (VC 4-7) in the Project Area, leaving at least 21,642 acres of old-growth unharvested.

Timber harvesting will reduce the amount of nesting habitat for marbled murrelets. Due to the amount of unknowns associated with marbled murrelets, such as no identified limiting factors, or the amount of old-growth currently being used; it is not known what the actual effects of timber harvest will be. Fragmentation or increased edge effects may also reduce habitat capability for marbled murrelets.

If the current population assumptions found in the Distribution and Population section are correct, and if it is assumed that nesting habitat is the limiting factor for the population, then a reduction in nesting habitat may have a proportional effect on the population. If so, then after a 10 percent reduction in potential nesting habitat under alternative 6 which is the maximum harvest alternative, (Table 2), the Chasina Project Area might still support 1,701 or more birds. This assumes no influence caused by fragmentation or increased edge, and a uniform use of the available, suitable habitat.

In summary, the Chasina Project may effect marbled murrelets, but the extent of this effect is unknown.



Table D-2  
**Acres and Percent of Old Growth Forest Proposed for Harvest, by Alternative**

|                | Alt. 1 | Alt. 2 | Alt. 3 | Alt. 4 | Alt. 5 | Alt. 6 |
|----------------|--------|--------|--------|--------|--------|--------|
| Habitat        |        |        |        |        |        |        |
| Old Growth     | 0      | 988    | 1,726  | 1,629  | 1,506  | 2,536  |
| Percent OG Cut | 0%     | 4%     | 7%     | 7%     | 6%     | 10%    |

SOURCE: Data derived from GIS data base.

Murrelet nests are exceedingly difficult to find, and no intensive nest searches in Chasina harvest units are planned. However, if any nests are discovered, they will be protected by a minimum 30-acre buffer to maintain microclimatic conditions around the nest tree. If research, monitoring, or administrative studies uncover new information addressing murrelets in Southeast Alaska, they will be reviewed for use in and/or replacement of this guideline.

### **KITTLITZ'S MURRELET** (*Brachyramphus brevirostris*)

Information is limited on the natural history of this species. Kittlitz's murrelet is distributed from Point Barrow south to at least Glacier Bay. It is most commonly seen from Cape Prince of Wales south to Glacier Bay from spring through the fall (Robbins et al. 1983, Peterson 1990). Winters are spent feeding in offshore pelagic waters. Kittlitz's murrelet forages on crustaceans in inshore marine waters during the breeding and nesting season in Alaska. Nests are generally located inland on the ground above the timberline in coastal mountains at the base of north-facing slopes. One egg per clutch is laid on the bare ground amid lichen-covered rocks (TLMP 1997).

No observations have been made of this species in the Project Area and it is not known to occur this far south. It does not appear that this species is dependent on old-growth forest for nesting habitat; therefore, no effects are anticipated for the Kittlitz's murrelet, if it should happen to occur here, as a result of the Chasina Project.

### **QUEEN CHARLOTTE GOSHAWK** (*Accipiter gentilis laingi*)

#### **Distribution and Population**

The American Ornithologists Union (AOU) recognizes two subspecies of the northern goshawk in North America, *Accipiter gentilis atricapillus* and *A.g. laingi*, the Queen Charlotte goshawk (AOU 1957). Taverner (1940) first described the darker plumaged Queen Charlotte goshawk as a distinct race occurring in the coastal temperate rainforests of the Queen Charlotte Islands and Vancouver Island, British Columbia. Webster (1988) found that the Queen Charlotte goshawk occurred from Vancouver Island north to the Taku River near Juneau. The northern goshawk is identified as a species of concern throughout its range.

On May 9, 1994, the USFWS received a petition from the Southwest Center for Biological Diversity and numerous co-petitioners, to list the Queen Charlotte goshawk as endangered pursuant to the Endangered Species Act. On August 19, 1994, the USFWS found that the information presented by the petitioners together with the information in USFWS files was substantial and indicated that listing may be warranted. Therefore, a status review of the species was initiated. After seeking public comments and reviewing all the available information on the goshawk, a finding was issued August 28, 1997, that listing this subspecies as endangered or threatened is not warranted.



The goshawk is a wide-ranging forest raptor that generally occurs in low densities, from 2.4 pairs (Central Alaska, McGowan 1975) to 11.0 pairs (Arizona, Crocker-Bedford and Chaney 1988) per 100 square kilometers, although population densities in Southeast Alaska may be much lower (Crocker-Bedford 1992). The most recent estimates of the goshawk population in Southeast Alaska range from 100 to 381 pairs (USDA Forest Service 1991a; Crocker-Bedford 1994) to 100 to 800 pairs (Alaska Interagency Goshawk Committee, Report of June 30, 1994).

Iverson et al. (1996) examined the conservation status of the northern goshawk in southeast Alaska by developing an understanding of goshawk ecology in relation to past, present, and potential future habitat conditions in the region under the current Tongass Land Management Plan (1997). "Forest ecosystem dynamics are described, and a history of forest and goshawk management on the Tongass National Forest are reviewed. Nearly 900,000 acres of the most productive old-growth temperate rain forest in southeast Alaska (public and private lands) have been harvested during the past 90 years and changed to early seral conifer forests. Goshawk habitat relations are described through a review of goshawk literature. Significant preliminary findings of a habitat relation study in southeast Alaska include the following: goshawks select productive old-growth forests, with >60 percent of all adult goshawk telemetry relocations occurring in this cover type; nonforest, clearcut and alpine cover types were least used and were avoided relative to their availability; and the median breeding season minimum convex polygon use areas of adult goshawks was about 10,000 acres. Goshawks predominantly use gentle slopes (70 percent of relocations) at elevations below 800 feet (54-74 percent of relocations); 24 percent of relocations occurred within riparian habitat zones, and nearly 20 percent of all relocations occurred within the beach fringe habitat extending 1,000 feet inland from the ocean shoreline. Goshawk nesting habitat is a nonrandom subset of the landscape with a significantly higher proportion of productive old-growth within a 600-acre analysis area surrounding known nests. The probability of persistence of goshawks has declined over the past 50 years owing to habitat loss and will likely continue to decline under current management plan regimes; however, the goshawk population likely is not in immediate peril. The predicted consequences of several alternative habitat management are compared. This analysis suggests that long-term rotation (e.g., 300 years) and uneven-aged silvicultural management may maintain habitat characteristics important to sustaining goshawk populations well distributed across the region. Although habitat reserves are not considered an essential component of a forest-wide goshawk conservation strategy, reserves, in combination with extended rotations, may be important where the intensity of past management actions has precluded the opportunity to attain a desired combination of forest age classes achievable under long rotations. Reserves are most likely critical if extensive clearcut logging continues."

Goshawks were discussed extensively in the FEIS for the 1997 TLMP: pages 3-359, 360 and 389-396, as well as in Appendix N. Please see these pages, as well as the complete document of Iverson et al. (1996), for a more thorough treatment of goshawk habitat associations and potential effects from timber harvests.

Goshawk nesting has not been observed in the Chasina Project Area. Inventories were conducted in the Project Area during the summers of 1995 and 1996 by Craig Ranger District personnel utilizing the Alaska Region Goshawk survey protocol. Goshawk calls were broadcast from more than 326 call stations in 68 harvest units for a total of 8,150 acres. There were not any responses to the calls and no confirmed sightings. More than 168 biologist days were spent surveying the Project Area. In the 1996 field season 150 person days were spent surveying 255 call stations for a total of 6,357 acres. Although the inventory techniques were among the best available, there is a high likelihood that nests were missed even in the stands that were sampled (Kimmel, J. T. and R. H. Yahner 1990; Kennedy and Stahlecker 1993; and Crocker-Bedford 1997 Goshawk Inventory Protocol). Any goshawks missed to date will not be protected unless chance observations are made during the timber sale layout process.

The 1997 Tongass TLMP calls for: preserving nesting habitat around all confirmed and probable goshawk nests whether or not they are currently occupied; maintain an area of not less than 100 acres of productive old-growth forest (if it exists) generally centered over the nest tree or probable nest tree site; No commercial timber harvest is permitted; existing roads may be maintained; no new road construction is permitted if there is another reasonable roading alternative; permit no continuous disturbance likely to result in nest abandonment within the surrounding 600 feet from March 15 to August 15.

### **Effects of Chasina Proposed Action on Populations or Habitat**

None of the alternatives propose timber harvest of known nest areas or designated post fledging areas. Alternatives that harvest the most timber would have the greatest potential to effect goshawks, therefore the Chasina Project may effect Queen Charlotte goshawks.

Any pairs of goshawks not discovered prior to timber harvest may be affected if the harvest units correspond to key stands of habitat. Any goshawk nest found prior to harvest will be protected utilizing the current goshawk management standards and guidelines from the 1997 Forest Plan.

## **HARLEQUIN DUCK (*Histrionicus histrionicus*)**

### **Distribution and Population**

The harlequin duck's range is divided into two separate and distinct regions: eastern and western. The eastern range embraces Iceland, parts of Greenland, and Labrador, with the winter range extending as far south as New Jersey. The western range includes northeast Siberia west to the Lena River, east to the Kamchatka Peninsula and the Commander Islands and north to the Arctic Circle, then across the Bering Sea to the Aleutian Islands, much of interior Alaska, and south to northwest Wyoming and central California (Bellrose 1980). For Alaska, the harlequin duck has been reported as a fairly common year-round resident, and at one season or another, has been recorded over much of the State, except the Arctic coast (Gabrielson and Lincoln 1959).

Available evidence indicates that the species breeds locally over much of southern Alaska, probably the Aleutians, and north to Anaktuvuk Pass. All ornithologists who have worked during the spring and summer months in the Alexander Archipelago and other parts of Southeast Alaska, have commented upon the numbers of these ducks, frequently summarizing their observations by stating that they were common or abundant (Gabrielson and Lincoln 1959).

Harlequins nest along inland rivers and streams. The nest site is usually 6 feet (but may be up to 60 feet) from water (DeGraff et al. 1991). The site chosen usually has shelter overhead - a recess in a stream bank, or among rocks, or under shrubs, trees, or stranded debris. Occasionally the nest is in an open area, but under shrubbery of other low vegetation, or even on a stream bar. There is no proof that harlequins nest in tree cavities (Bellrose 1980; Armstrong et al. 1983; Kortright 1962; Godfrey 1979; Palmer 1975). During the winter the harlequin duck is common to abundant in the coastal waters of Southeast Alaska, Prince William Sound, Cook Inlet, the bays of the Alaska Peninsula, the Aleutians and the Pribilofs (Gabrielson and Lincoln 1959). Preferred winter habitat is reported to be areas along surf-pounded rocky coasts -- not in sheltered bays and fjords, but instead where water is one to two fathoms deep and turbulent, and where bottom fauna abounds (Palmer 1975).

Harlequins feed on molluscs, crustaceans, insects, fish, and echinoderms (Bellrose 1980).

### **Effects on Population or Habitat**

Nesting habitat for the harlequin duck occurs along inland rivers and streams. Riparian habitats along all rivers and streams on the Forest will be managed according to the Stream and Lake Protection management prescription or a more restrictive management prescription (such as when a stream or river is in a Wilderness Area). The Stream and Lake Protection Management Prescription of the 1997 TLMP will protect nesting habitat within the Chasina Project Area. Since winter habitat occurs in the marine environment, in areas of high surf and rocky beaches, no effect on harlequin ducks is anticipated with any alternatives of the Chasina Project.

## **OLIVE-SIDED FLYCATCHER (*Contopus borealis*)**

### **Distribution and Population**

The olive-sided flycatcher breeds in wooded regions from central Alaska east to Newfoundland and south to northern Baja California and central Arizona in the west, central Minnesota and northern Michigan in the Central States, and North Carolina and Tennessee in the East. The species winters in South America.

It inhabits open coniferous forests and forest edges along lakes, streams, and muskegs (Bent 1942). Godfrey (1979) described the habitat of the species as "Burntlands with standing dead trees, bogs, lakeshores with water-killed trees,



lumbered areas, and other clearings in woodland". DellaSala et al. (1994) noted that the species was often observed using habitats associated with lakes and muskegs during a breeding bird study on central Prince of Wales Island.

#### Effects of Chasina Proposed Action on Population or Habitat

Riparian habitats along all lakes, rivers, and streams on the Forest will be managed according to 1997 TLMP.

Upland habitat value for the olive-sided flycatcher may improve due to logging in the Chasina Project. Created openings will produce greater edge, and if reserve trees and snags are retained, flycatcher habitat could actually be improved. Therefore, though the Project may affect olive-sided flycatcher habitat, the effect is likely to be positive.

### **SPOTTED FROG (*Rana pretiosa*)**

#### **Distribution and Population**

The spotted frog occurs in or near fresh water and is believed to range south from the Taku river and other transboundary rivers to some of the islands of Southeast Alaska and British Columbia (Holmberg, April 17, 1992). Spotted frogs have been documented in the Stikine River basin (Waters 1992). Presence of spotted frogs on Prince of Wales Island has not been confirmed, despite surveys having been conducted.

#### **Effects of Chasina Proposed Action on Population or Habitat**

Riparian habitats along all lakes, rivers and streams on the Forest will be managed according to the 1997 TLMP. With implementation of TLMP standards and guidelines, no effects on the spotted frog is anticipated by the Chasina Project, even if they are found to occur within the Project Area.

### **BULL TROUT (*Salvelinus confluentus*)**

#### **Distribution and Population**

Although the range of bull trout in the contiguous United States has become greatly restricted in recent times (Goetz as cited in Haas and McPhail 1991), it still exists as far south as the Oregon-California border, north through Canada and in the Yukon River system in Alaska (Haas and McPhail 1991). Bull trout are largely confined to interior regions throughout their distribution, only reaching the Pacific coast in the Puget Sound area of Washington and in the Fraser River drainage in British Columbia (Haas and McPhail 1991). Since bull trout have only been observed in the interior drainage of other major river systems, it is not likely that bull trout occur in the streams of the Chasina Project Area.

#### **Effects of Chasina Proposed Action on Population or Habitat**

Riparian habitats along all lakes, rivers and streams on the Forest will be managed according to the 1997 TLMP. With implementation of TLMP standards and guidelines, no effects on the bull trout is anticipated by the Chasina Project, even if they are found to occur within the Project Area.

### **US FISH and WILDLIFE SERVICE PLANT SPECIES of CONCERN**

#### **YUKON ASTER (*Aster yukonensis*)**

This taxon is known from an area near Bettles, north of the Yukon River, and from the north side (continental side) of the St. Elias Range, north of Yakutat (Murray and Lipkin 1987). The plant would not be expected to occur in the Project Area (DeMeo 1992).



Searches for candidate and sensitive plants were made on the Project Area by interdisciplinary-trained teams as well as 24 field days by a botanist who held a MS in botany. No observations of this species were made. Since *Aster yukonensis* is not known to occur in the Project Area, there are no anticipated effects of the Chasina proposed action on its population or habitat.

### **THICK-GLUMMED REEDGRASS (*Calamagrostis crassiglumis*)**

Disjunct populations of this grass are known along the Pacific coast from Kodiak Island south to northern California. The plant grows in marshy wet areas, muddy areas near lakes, beach meadows, and rocky soil. This plant does not grow in muskeg habitats (Muller 1991). Based on collections in Alaska and British Columbia, the plant may be found in the Project Area.

No observations of this species were made during field reconnaissance, which included 24 field days of a botanist with a MS in botany. Furthermore, this species is not known to occur in forested areas; therefore, no direct effects from timber harvest are anticipated. Changes in drainage due to roading or other activities may affect habitat and populations of the plant (DeMeo 1992). Stream, estuary, and lakeshore buffers should provide adequate protection for this plant, in the event that it should occur in the Project Area.

The USFWS has recently requested that this species not be considered at this time. This is due to a recently published taxonomic work which "lumped" this taxa with the more common *Calamagrostis stricta* (TLMP 1997).

### **GOOSE-GRASS SEDGE (*Carex lenticularis* var. *dolia*)**

This sedge is known to occur in the coastal mountains of Alaska and British Columbia and the Rocky Mountains from Jasper, B.C., south to Glacier National Park, Montana. Its range in Alaska is limited to the alpine of coastal Southcentral and Southeast Alaska and the Aleutian Islands. In Southeast the goose-grass sedge is known from sightings at Mendenhall Glacier, Bailey Bay on Cleveland Peninsula, and the Chickamin Glacier. This species may be expected to occur in the Project Area (DeMeo 1992). Its habitat is wet alpine meadows and bare edges of snowbeds.

No observations of this species were made during field reconnaissance of harvest units and roads. The field reconnaissance included surveys by trained IDT members as well as 24 days by a botanist with a MS in botany. This species is not known to occur in forested areas; therefore, there are no effects anticipated from timber harvest.

Recent taxonomic treatment of *Carex* have added *Carex enanderi* to this taxon. Consequently this taxon is more common, but still rare (TLMP 1997).

### **MONTIA BOSTOCKII (No Common Name)**

This small herb occurs in alpine and subalpine meadows in the Brooks Range through the Wrangell-St. Elias Range (Muller 1991). It would not be expected to occur in the Project Area.

No observations of this species were made during field reconnaissance. Since *Montia bostockii* is not known to occur in the Project Area, there are no effects anticipated from Chasina timber harvest activities (DeMeo 1992).

## IV. USDA FOREST SERVICE SENSITIVE SPECIES EVALUATION

### OSPREY (*Pandion haliaetus*)

Ospreys occur in low numbers in Southeast Alaska during the spring/summer nesting period from late April through August. They are believed to overwinter in Mexico and Central America. All documented osprey nest sites occur outside the Chasina Project Area. There are eight documented osprey nest sites and four known nesting pairs at Thomas Bay, Wrangell Narrows near Finger Point, and near the mouth of McCormick Creek on Wrangell Island (Hughes, undated, as cited in Forest Service 1991b). Nest trees in these areas consist of broken-top spruce (live or dead) and snags of western hemlock in hemlock/spruce forest types near streams or coastal beaches. A single osprey was observed in the Project Area in the summer of 1997. No nest was found. If a nest is found during the process of this sale the appropriate standards and guidelines will be followed (TLMP 1997). Historically, the Southeast Alaska population of osprey appears to have remained stable but low. It is unknown why osprey occur in relatively low numbers in this region. Available nest sites and foraging areas do not appear to be limiting factors to osprey, but is perhaps due to the abundance of bald eagles.

### Effects of Chasina Proposed Action on Population or Habitat

The Chasina Project is not expected to affect nesting osprey as no known nest sites occur in the Project Area and availability of nesting and foraging areas does not appear to be a factor limiting population growth. In addition, minimal or no effect on preferred osprey habitat is expected from project activities as uncut buffers will be maintained near streams, lakes, and coastal areas. If nests are discovered in the Project Area. The standard and guidelines outlined in the Forest Plan (1997) will be followed.

### TRUMPETER SWAN (*Cygnus buccinator*)

The swan is the largest waterfowl species in the world. Its present range is only a vestige of the once vast region of North America that it frequented in both summer and winter (Bellrose 1980). Trumpeter swans breeding in Alaska spend the winter along the Pacific Coast from the Alaska Peninsula to the mouth of the Columbia River, where they take advantage of open waters of saltwater estuaries and freshwater lakes and rivers. Trumpeter swans are present in the Project Area primarily during the fall and early spring migration periods and during winter. The only documented nesting trumpeter swans occur north of the Project Area at Yakutat (19 pairs). These nests occur in wetlands and/or riparian habitat along streams, rivers, lakes and ponds.

No high use resting stops/wintering areas for swans have been found in the Project Area, however during the 1995 winter swan survey 3 swans were observed in Dora Bay. No swan surveys have been conducted in the Project Area since 1995.

### Effects of Chasina Proposed Action on Population or Habitat

Most timber harvest activity will not be in conflict with the TLMP 1997 standards and guidelines for trumpeter swans, since swans are not present in the Project Area when most of the timber harvest activity is likely to occur. There is a potential for conflict when swans are migrating through or returning to wintering areas. Noise from road construction, timber harvest, and hauling of logs could frighten swans away from their preferred resting and feeding areas. However, limiting timber harvest operations to periods when swans are not present (April 1 through November 1) would mitigate these potential impacts. Kitkun Bay and the head of South Arm are two potential areas within the Chasina Project Area that swans could use as wintering areas.

## SENSITIVE PLANT INVENTORY

The Chasina Project Area was extensively surveyed by highly qualified botanists: 3 surveys in 1994 by Mary Stensvold (US Forest Service Regional Botanist), 14 surveys by Devin Kennemore (who held a MS in botany) and 7 surveys by



Thomas Belfield (who held a BS in botany). Their survey efforts were mostly within the potential harvest units (18 units). The botanists used the intuitive controlled approach which emphasized habitat potentially suitable for sensitive plants. Plant surveys of potential roads was limited because most roads had not yet been flagged by the time of the botanical surveys; thus only 3 miles of potential roads were surveyed. In addition to surveys by qualified botanists, most field personal received training in sensitive plant identification.

The goose-grass sedge is on both the US Forest Service Sensitive Plant list and the USFWS Species of Concern list. It is discussed only once, as a USFWS Species of Concern.

### **EDIBLE THISTLE (*Cirsium edule*)**

This regionally endemic thistle species is distributed primarily along coastal Oregon, Washington, and British Columbia and barely reaches southern most Southeast Alaska. There are documented occurrences near Hyder, Alaska near the border of Canada (Forest Service 1994) and two in Misty Fiords National Monument (Forest Service 1996). It is not expected to occur in the Project Area. Its habitat in Alaska is characterized as wet meadows and open woods along glacial streams.

No observations of this species were made during field reconnaissance which included 21 days by a botanist with a MS in botany as well as surveys by trained field personal. No sightings have been documented in the Project Area. Since timber harvest activities generally avoids wet meadows and stream margins where this species would be expected to be found, no direct effects from timber harvest are anticipated even if the species were to occur in the Project Area.

### **DAVY MANNAGRASS (*Glyceria leptostachya*)**

This grass species is distributed from Southeast Alaska to central California. Its distribution in Alaska is limited to central and southern Southeast Alaska. It is known to occur on the Thorne Bay Ranger District, and in Upper Carroll Inlet (Forest Service 1995). However it is easily overlooked and likely to be more widespread in Southeast (Forest Service 1994).

No observations of this species was made during field reconnaissance, which included 24 days by a qualified botanist as well as some surveys by trained field personal. There were no documented sightings of this plant in the Project Area. No impacts to this species, as a result of road construction or timber harvest are anticipated because stream and lakeshore buffers should provide adequate protection for this plant should it happen to occur in the area.

### **WRIGHT FILMY FERN (*Hymenophyllum wrightii*)**

This fern species occurs in coastal areas of Southeast Alaska and British Columbia. Sightings have been documented in Alaska but are limited to Biorka and Mitkof Islands (Forest Service 1994). It is unknown if the species occurs in the Project Area. This species appears to prefer humid shaded boulders, cliffs, tree trunks, and the damp woods in the wettest maritime regions. In Alaska, it has been found in small populations on the base of trees and rock outcrops in damp woods.

No observations of this species were made during field reconnaissance, which included 24 days of surveys by a qualified botanist. No sightings have been documented in the Project Area. Since Wright filmy fern is not known to occur in the Project Area, no effects are anticipated from Chasina timber harvest activities. However, potentially undetected specimens could be affected by the removal of trees from the woods of the Project Area.

### **TRUNCATE QUILLWORT (*Isoetes truncata*)**

This rooted aquatic species is known from a few widely isolated populations on Vancouver Island and southcentral Alaska on the Copper River Delta (Forest Service 1994) as well as one unconfirmed occurrence in the Ketchikan Area. It is unknown if this species occurs in the Project Area. Truncate quillwort occurs in shallow water of lakes and streams.



No observations of this species were made during field reconnaissance, which included 24 survey days by a qualified botanist. No sightings have been documented in the Project Area. Furthermore, due to its rooted aquatic nature, this species does not occur in forested areas; therefore, no direct effects from the Chasina Project, either from timber harvest or road construction are anticipated. Even if the species does exist in the Project Area, stream and lakeshore buffers should provide adequate protection for this plant.

Recent reevaluations of *Isoetes truncata* reveal that the ones identified from the Sitka Ranger District were misidentifications of *Isoetes occidentalis*, which was not previously known to occur in Alaska. It is suspected to occur from Prince William Sound south through the Tongass National Forest (TLMP 1997).

#### **CALDER LOVAGE (*Ligusticum calderi*)**

This plant species occurs in British Columbia and Southcentral and Southeast Alaska. Documented occurrences in Alaska are limited to two disparate areas at Kodiak Island and Dall Island (just west of Prince of Wales Island) in Pleistocene refugia on limestone substrate (Forest Service 1994). There is one unconfirmed occurrence on Bokan Mountain on Prince of Wales Island (Forest Service 1996). It is unknown if this species occurs in the Project Area. Calder lovage occurs on rocky cliffs, open boggy or rocky slopes, and edges of coniferous forests. In Alaska it is known from alpine meadow habitats and edges of subalpine mixed coniferous forest.

No observations of this species were made during field reconnaissance, which included 24 survey days by a qualified botanist. No sightings have been documented in the Project Area. Since Calder lovage is not known to occur in the Project Area, no effects are anticipated from Chasina timber harvest activities. However, potentially undetected specimens could be affected by the removal of timber along subalpine coniferous forest edges.

#### **CHORIS BOG ORCHID (*Platanthera chorisana*)**

In Alaska, this bog orchid species is limited to the Aleutian Islands and southern coastal areas (Forest Service 1994). Numerous occurrences have been documented in Alaska. Reported sightings are disjunct and infrequent. Recent botanical surveys on Revillagigedo Island have revealed a minimum of 12 populations of this species. During field reconnaissance, which included 24 survey days by a qualified botanist, several populations of this species were found in the Project Area.

With the increasing number of observations, it is possible that this species is not as rare as previously thought. Efforts will be made to avoid the populations of this species which were found within the Chasina Project Area. It is possible that timber harvest and road construction activities may inadvertently destroy some individual or populations plants that were not discovered during field observations.

#### **BOG ORCHID (*Platanthera gracilis*)**

This species of bog orchid is limited to a small geographic range in southern most Southeast Alaska and adjacent British Columbia (Forest Service 1994). Documented sightings have been made in Alaska near Pearse Canal and on Dall, Revilla and Annette Islands. It is unknown if this species occurs in the Project Area. This plant occurs in wet open meadow habitat. It is undetermined whether the taxon of this species is distinct; if it is not, it may be more common than previously believed (Forest Service 1994).

No observations of this species were made during field reconnaissance, which included 24 survey days by a qualified botanist, of harvest units and roads. This species is not known to occur in forested areas; therefore, there are no effects anticipated from timber harvest or road construction activities.

#### **LOOSE-FLOWERED BLUEGRASS (*Poa laxiflora*)**

The distribution of this grass species is scattered between Southeast Alaska and Oregon. Sightings have been documented in Southeast Alaska near Hoonah, Sandborn Canal at Port Houghton, and Admiralty Island (Forest Service

1994). It is not known if this species occurs in the Project Area. Loose-flowered bluegrass is associated with moist, open lowland woods and open-forest meadows.

No observations of this species were made during field reconnaissance, which include 24 survey days of a qualified botanist. No sightings have been documented in the Project Area. Since loose-flowered bluegrass is not known to occur in the Project Area, no effects are anticipated from Chasina timber harvest activities. However, potentially undetected specimens could be affected by the removal of timber from harvest units encompassing open lowland woods and open-forested meadows.

### **STRAIGHT-BEAK BUTTERCUP (*Ranunculus orthorhynchus* var. *alaschensis*)**

This species of buttercup is distributed from coastal southern Southeast Alaska to adjacent British Columbia and Vancouver Island (Forest Service 1994). It occurs in moist, open lowland meadows and other moist open habitats. This species has been found in several locations around Southeast Alaska, including Hyder, Cleveland Peninsula, on Long, Revilla and Prince of Wales Islands.

Observations of this species were made during field reconnaissance. Field reconnaissance included 24 survey days by a qualified botanist as well as surveys by trained field personal. Direct effects due to removal of timber from Chasina harvest units are not anticipated to be significant to this species as its preferred open, moist habitats are generally avoided for timber harvest.

The most recent treatment of the genus *Ranunculus* does not recognize this variety as distinct from the more common *Ranunculus orthorhynchus* var. *orthorhynchus*. The variety *alaschensis* was considered a regional endemic ranging from the central panhandle south to Vancouver Island (TLMP 1997).

### **QUEEN CHARLOTTE BUTTERWEED (*Senecio moresbiensis*)**

This species of butterweed is limited to the Queen Charlotte Islands of British Columbia and to disjunct populations in southeastern Alaska and northwestern Vancouver Island (Forest Service 1994). Occurrences have been documented in Alaska on Prince of Wales, Baker, Coronation, and Dall Islands. It is not known if this species occurs in the Project Area. Queen Charlotte Butterweed occurs in shady wet areas and bogs of montane to alpine habitats, to open, rocky or boggy slopes, and in open, rocky heath or grass communities (Douglas 1982 in Forest Service 1994).

No observations of this species were made during field reconnaissance, which included 24 survey days by a qualified botanist. No sightings have been documented in the Project Area. Since Queen Charlotte butterweed is not known to occur in the Project Area, no effects are anticipated from Chasina timber harvest activities. Even if this species does occur in the Project Area, direct effects due to removal of timber from Chasina harvest units are not anticipated to be significant as the preferred open, moist habitats of this species are generally avoided for timber harvest.

### **UNALASKA MISTMAIDEN (*Romanzoffia unalaschensis*)**

This species is suspected on the Craig Ranger District. The Unalaska mistmaiden grows on ocean bluffs, often in sea-spray, from southern Vancouver Island and the adjacent mainland south. It is known from one occurrence on the Thorne Bay Ranger District on Prince of Wales Island. It is smaller, less than 10cm tall, than the Sitka mistmadien (*Romanzoffia sitchensis*), which can grow from 5-30 cm tall, and grows from conspicuous brownish-wolly tubers (Pojar J. and A. MacKinnon 1994). It also differs from *Romanzoffia sitchensis* in its sticky, hairy leaves and shorter stalks. It is often mistaken for a *Saxifraga* (Forest Service 1995).

No observations of this species were made during field reconnaissance, which included 24 survey days by a qualified botanist. Since the Unalaska mistmaiden is not known to occur in the Chasina Project Area no effects are anticipated from timber harvest or road construction.



## **NETTED WILLOW (*Salix reticulata* ssp. *glabellcarpa*)**

This netted willow is one of the species being proposed to be added to the Forest Service Sensitive species list. It is suspected to occur in the Ketchikan Area.

Netted willow occurs from northern southeast Alaska to Yakutat, and from British Columbia south to California. Plants south of the Queen Charlotte Islands are usually referred to as 'snow willow' (*S. reticulata* ssp. *nivalis*). The snow willow has 2-22 flowers per catkin whereas the netted willow has 20-50 flowers per catkin. The netted willow also has strongly veined, dark green leaves that are nearly round, sometimes with long, silky hairs beneath (Pojar et al. 1994). It grows as a prostrate shrub on alpine cliffs and ledges above 2400 feet (Argus, George W. 1965).

No observations of this species were made during field reconnaissance, which included 24 survey days by a qualified botanist. Since the netted willow is not known to occur in the Project Area, no effects are anticipated from the Chasina Project timber harvest or road construction.

## **PRINCE OF WALES SPRUCE GROUSE (*Falcapennis canadensis isleibi*)**

The Prince of Wales spruce grouse (*Falcapennis canadensis isleibi*) is a species of interest in Southeast Alaska, although it is not listed as threatened, endangered, sensitive, or a species of concern. This species occurs in low densities on and near Prince of Wales Island (Gustafson 1994). The Prince of Wales spruce grouse is a new subspecies of the spruce grouse. The Alexander Archipelago population is now described as *Falcapennis canadensis isleibi* (Dickman, R.W. and J. Gustafson. 1996). This species uses the old-growth forests, especially those containing spruce, young second growth prior to canopy closure, as well as other habitats. The Prince of Wales spruce grouse has not been observed in the Project Area; therefore the project is not expected to affect this species.



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## **VI. DOCUMENTATION OF CORRESPONDENCE WITH OTHER AGENCIES**

Dec. 4, 1990: NMFS publishes final rule in the Federal Register listing the Steller sea lion as a threatened species.

March 20, 1991: Interagency Wildlife Technical Committee Meeting.

April 2-4, 1991: Marbled murrelet workshop sponsored by the USFWS.

Sept. 5, 1991: USF&W letter critique of USDA Forest Service Region 3 Management Guidelines for the Northern Goshawk in the Southwestern Region, (56 FR 122, 28853).

Dec. 17, 1991: Status report on R10 sensitive species candidates.

Jan. 28, 1992: Forest Service letter to NMFS requesting list of T & E species in proposed project areas.

Feb. 6, 1992: NMFS letter listing humpback whale and Steller sea lion as being within the central Prince of Wales project area.

March 5, 1992: Letter from USFWS concerning T & E in Lab Bay, Prince of Wales, Polk and Revilla timber sale areas.

April 8, 1992: Phone conversation with NMFS about the status of recovery plans for whales and the Steller sea lion, and proposed regulations for approaching marine mammals.

April 8, 1992: Letter to USFWS requesting updated list of T & E and proposed and candidate species.

April 9, 1992: Phone conversation with the Alaska Natural Heritage Program to check on any changes in the listing of candidate plants.

April 15, 1992: Letter from USFWS updating the list of threatened, endangered, and candidate species likely to occur on the Forest.

April 17, 1992: Phone conversation with the USFWS clarifying that the Aleutian Canada goose is not likely to occur on the Forest.

June 24, 1992: USDA Forest Service memo describing current status of goshawk call survey.

Aug. 13, 1992: USF&W letter critique of USDA Forest Service Region 3 Management Guideline Revision for the Northern Goshawk in the Southwestern Region, (57 FR 119, 27424).

Aug. 18, 1992: Interim habitat recommendations for the northern goshawk, USDA Forest Service, Alaska Region, Juneau.

Nov. 24, 1995: Letter from USFWS in response to the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for timber harvest in the Chasina Project Area.

Jan. 29, 1996: Meeting with ADF&G and USFWS on Chasina Project old-growth retention strategy.

Sept. 18, 1997: Letter from USFWS responding to request for latest list of T&E species for Southeast Alaska and comments on draft BA/BE for Chasina Project.

Oct. 15, 1997: Letter from NOAA concurring that the Chasina Project is not likely to affect listed species, nor those species' designated critical habitat.

Nov. 19, 1997; Meeting with ADF&G and USFWS on Chasina Project old-growth retention strategy.

Dec. 17, 1997; Letter from USFWS for Section 7 consultation, agreeing that populations of the American peregrine falcon will not likely be adversely affected as a result of the Chasina Project





# **Appendix E**

## **LTF Site Guidelines/ LTF Evaluation and Dive Report**

# Appendix E

LTE Site Guidelines  
LTE Evaluation and  
Site Report

# **EVALUATION OF LOG TRANSFER FACILITIES Using 404(b)(1) Guidelines of the Clean Water Act**

## **CHASINA PROJECT**

**US Forest Service  
Tongass National Forest  
Ketchikan Area  
Ketchikan Alaska**

**June 12, 1996**





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ATTACHMENTS

- A. N.Arm Moira Site #4N
- B. Site Map of N.Arm Moira sites investigated
- C. W. Arm Cholmondeley site #6





# EVALUATION OF LOG TRANSFER FACILITIES

## Using 404(b)(1) Guidelines of the Clean Water Act.

Guidelines governing siting, construction, operation and monitoring of log transfer facilities (LTF) under 40 CFR 230.12(a)(3) read as follows:

### V. Log Transfer Facilities Siting, Construction, Operation, and Monitoring

A. Site log transfer facilities in locations which will best avoid or minimize potential impacts on water quality, aquatic habitat and other resources. During site analysis, cooperate with State and Federal agencies per stipulations in Memoranda of Understanding or cooperative agreements to assemble required data and evaluate alternatives.

Evaluate alternatives using the 404(b)(1) guidelines to determine if "(i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or (ii) The proposed discharge will result in significant degradation of the ecosystem; or (iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or (iv) There does exist sufficient information to make a reasoned judgement as to whether the proposed discharge will comply with these guidelines.

Log transfer facilities under the various action alternatives for the CHASINA project were evaluated on the basis of items i through iv noted above. That evaluation is presented in subsequent discussions.

Specific Log Transfer (LTF) site locations are contained in Attachments A and C.

### CONSTRUCTION OF N. MOIRA LTF SITE #4N

Includes constructing the LTF to a Low Angle Ramp system with associated uplands log sorting area.

#### Evaluation of Alternatives.

Determine if; (i) **There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences.**

#### Description:

The N. Arm Moira area has no existing LTFs at this time. The site (#4N) is approximately 2 miles northwest of the mouth of N. Arm where it connects with Moira Sound. The site would be developed as a Low-Angle Ramp system costing approximately \$80,000 to construct.

N. Arm Moira LTF would serve approximately 5400 acres of land in the Port Johnson/N. Arm area of which approximately 914 acres are proposed for harvest.

#### Alternatives to construction of N. Arm Moira LTF(#4N):

No action alternative: No harvest of timber resources in Port Johnson- N. Arm Moira area.

Relocate LTF

Construct road connections to existing, active LTFs.

Sub-alternatives to the proposed LTF construction.

Dry land transfer from bulkhead to barge

Chain Slide system.

A-frame lift off system.

Other alternatives not demonstrated as practicable were not considered any further. For example; pile supported bridge ramp and barge or special slide out ramps etc.

## Evaluation between alternatives

**No Action:** The No Action alternative would eliminate the need for an LTF, thus producing no discharge of any pollutants. Accordingly, access to 4500 acres of timber resources would be forgone.

**Relocate LTF:** Relocation of the LTF to another site in the area would create the same or greater impacts to other undisturbed portions of the aquatic habitat. Haul and fuel use would be more than that of the proposed site. There were five other sites evaluated in the immediate area (2N, 3N, 5N, 6N, 7N, see attachment B for locations), and only this site was deemed acceptable by the NMFS and USFWS divers. Accessing these other sites would require additional road which in turn would cause greater impacts to the ecosystem other than the aquatic habitat.

**Construct Road Connections to Existing, Active LTF's:** Road connections to an existing LTF at Lancaster Cove is feasible. The connection to the Lancaster Cove road system and LTF would require construction of an additional 3 miles of road. The road as planned would be entirely within a Habitat Conservation Area so would access no additional volume for the project or for any near future projects. Estimated cost of the additional road is approximately \$600,000. The cost of construction of the N. Moira LTF is approximately \$200,000 including the associated road access and log sorting areas. The road connection to Lancaster Cove road system and LTF would disturb an additional 27 acres of productive land, but would disturb less acreage of marine habitat.

**Sub-alternatives to the proposed LTF modification**

**Dry Land Bulkhead to Barge Transfer:** Use of the site for barge loading would require construction of a 3 to 5 acre sort yard, relocation of the access road, and expansion of the existing fill with bulkhead to deep water.

The barge system will effect 4 to 6 acres of forested wetlands, 0.2 acres of additional fill in aquatic habitat and cost approximately \$1,000,000. Haul and fuel use would be about the same as modification of the existing site to an A-frame system.

**Chain Slide System:** Modification to a chain slide would require relocation of the access road. This would effect about 1.5 acres of forested wetlands and about 0.2 acres of aquatic habitat associated with fill and slide structure. Road and LTF construction costs would be about \$627,000. Fuel use and haul would be the same as the proposed action.

**Determine if, (ii) The proposed discharge will result in significant degradation of the aquatic ecosystem**

N. Moira #4N is a new site that has moderate bathymetric characteristics with strong tidal currents that will provide good flushing characteristics.

The proposed Low Angle Ramp system is capable of transferring logs without any significant entry velocity. This capability will minimize discharge of bark into the aquatic ecosystem.

Surface runoff into the aquatic ecosystem will be kept to a minimum by insloping the road and LTF surface, collecting and settling runoff, and periodic surface cleanup of bark and woody debris. (40CFR 122.27 Silvicultural Point Sources; applicable to State NPDES programs, see 40 CFR 123.25).

**Determine if, (iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem**

The existing site will adapt to a Low Angle Ramp system with the least amount of impacts to both the uplands and aquatic ecosystem. The Low Angle Ramp system is capable of eliminating entry velocities.

Surface runoff into the aquatic ecosystem will be kept to a minimum by insloping the road and LTF surface, collecting and settling runoff, and periodic surface cleanup of bark and woody debris. (40CFR 122.27 Silvicultural Point Sources; applicable to State NPDES programs, see 40 CFR 123.25).

The National Marine Fisheries Service and U.S. Fish and Wildlife Service have found the site to be acceptable. See attached National Marine Fisheries and US Fish and Wildlife agencies report.

The construction of the new site into a Low Angle Ramp system is preferred to relocation or modification into other systems.

A low-angle ramp is the most economical for such intermittent operations. The next most economical method is the single A-Frame system.



## HELICOPTER TRANSFER SITES #1H through #8H (Port Johnson/N. Arm Moira and South Arm of Cholmondely)

Includes flying logs from the harvest area directly to a barge.

### Evaluation of Alternatives.

Determine if; (i) **There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences.**

#### Description:

Helicopter transport of logs from the harvest area directly to a barge eliminates need for constructing roads on steep ground and allows the economic harvest of isolated forest lands.

There are alternatives in the environmental impact statement that will utilize some but not all of these sites and there are alternatives that utilize all the helicopter barge sites.

#### Alternatives to the proposed Helicopter Transfer System.

No action alternative: No harvest of timber resources in the tributary areas.

Connect isolated harvest areas to existing or planned road systems.

#### Evaluation between alternatives

**No Action:** The No-Action alternative would eliminate the need for reactivating the LTF, thus producing no discharge of any pollutants. Accordingly, access to 600 acres of timber resources would be forgone.

**Helicopter Transfer:** (Preferred Alternative) Helicopter transport directly to a barge will eliminate use of any fill in the aquatic ecosystem.

**Connect isolated areas to existing road systems.** Connecting to Lancaster Cove and or W. Arm Cholmondeley road systems would require numerous miles of road construction across existing slide areas, have massive rock cuts, and very steep adverse haul grades making haul practicability marginal. A connection to W. Arm Cholmondeley site would cost \$1,200,000 and would disturb about 27 acres of productive land. Numerous mass failures would be expected. This alternative would increase fuel use and haul costs \$37,000. The total additional construction costs for connecting to, and using W. Arm Cholmondeley proposed LTF would be about \$1,482,000 more than helicopter transfer. From a visual standpoint, high impacts would be expected due to massive full bench cuts and mass failures.

#### Determine if; (ii) **The proposed discharge will result in significant degradation of the aquatic ecosystem**

Helicopter transfer of logs from the harvest area directly to a barge minimizes impacting the shallow high value marine habitat near the shoreline. The need for fill in the aquatic ecosystem is eliminated by using this system.

Landing logs on a barge will eliminate discharge of bark into the aquatic ecosystem. Periodic cleaning of the barge deck would minimize surface runoff into the aquatic ecosystem.

#### Determine if; (iii) **The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem**

The Helicopter transfer system will create the least amount of impacts to both the uplands and aquatic ecosystem. The need for filling in aquatic habitat and surface runoff control is eliminated by use of this system.

The use of helicopter transfer for the isolated S. Arm Cholmondeley and Port Johnson areas is preferable to developing additional land LTF's or connecting to other LTF sites as it will minimize both upland and aquatic ecosystem impacts and costs. Development of roads and the LTF would be uneconomical for the amount of timber volume being harvested at this area.

Surface runoff into the aquatic ecosystem will be kept to a minimum by periodically cleaning the barge deck of bark and woody debris.



## **CONSTRUCTION OF W. ARM CHOLMONDELEY LTF SITE #6**

Analysis of this site was completed in the Final Environmental Impact Statement for the 1989-1994 Operating Period for the Ketchikan Pulp Company Long Term Sale Area. Portions of this analysis is included in attachment C, the remainder of the analysis is included by reference.

NORTH ARM MOIRA  
SITE 4-N

Location: NE1/4, NE1/4, Sec. 14, T.78 S. R.88 E. Graig A-1  
55° 06' 49"N 132° 06' 07"W

Proposed Volume: 10-15 MMBF for total rotation.

Facility type: Low-Angle (12%) ramp.

Upland Area: Upland area has moderate slopes. Excavation would be about 7,500 cy.

Rafting Area: Ample room for rafting adjacent to the site. The site does not lie within any area designated for forestry activities in the AK POW PLAN.

Camp Facilities: It is expected that the float camp would be located in Cannery or Nowiskay Cove. Cannery Cove has a stream that may serve as a water supply. The commute distance would be about 1.5 miles.

Access: The access road would have up to 16% grades. It does not appear feasible to connect the area served by Site 4-N, to the existing Lancaster Cove LTF as the terrain between 3-N and 4-N is extremely steep.

Fisheries: There are no cataloged fish streams near the site.

Marine Conditions: The beach slopes to seaward at 12% for about 200 ft.

The footprint would be minimal both in the marine and uplands as the bathymetric and topographical characteristics are almost ideal for such a structure.

This site has been impacted by past log storage activities. Because of past impacts, this site was preferred.

Other Environmental: Initial landings could be made at the site.

Tideland Plans: Site 4-N is not within any area managed for forestry activities.

**Recommendations:**

Site 4-N is recommended for use due to the following:

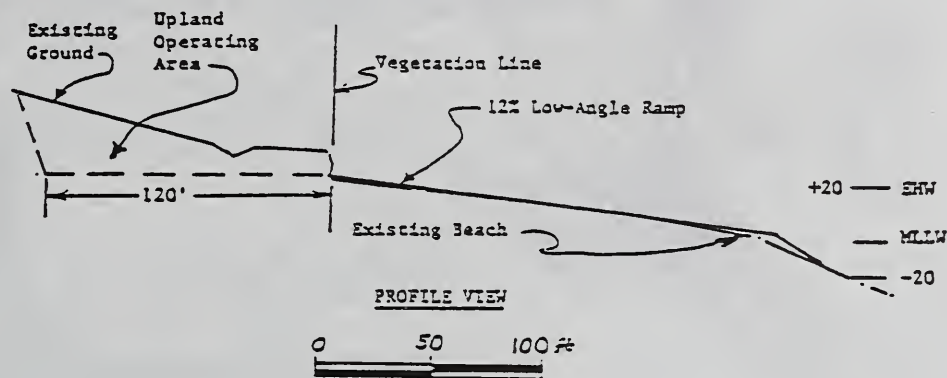
The site is preferred from a marine biological standpoint, primarily because the area has been impacted in the past. Further use would retain impacts to currently impacted areas.

The facility will create the smallest footprint on both the marine and upland areas.

Site 4-N requires the least amount of access road in serving the tributary area.

It is further recommended that the feasibility of a road link to Lancaster Cove LTF be explored on the ground. This may eliminate the need for an LTF for the tributary area.





#### SOUNDINGS

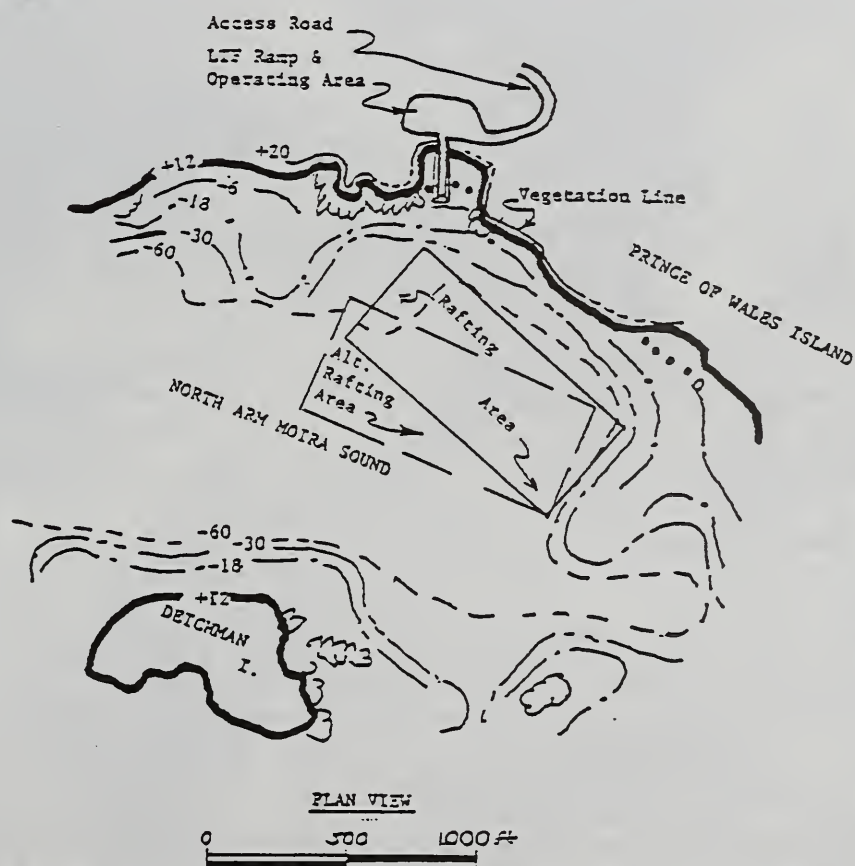
EHW to EW; (Exposed beach)  
-12% for 125'

|    |     |     |     |     |
|----|-----|-----|-----|-----|
| 11 | 30  | 36  | 49  | 50+ |
| 66 | 108 | 121 | 155 | 184 |

#### AREAS AFFECTED (Prelim. Footprint)

Marine habitat 0.2 ac.

Upland area 0.5 ac.



MOIRA SOUND

NORTH ARM MOIRA 4-N  
Low-Angle Ramp LTF

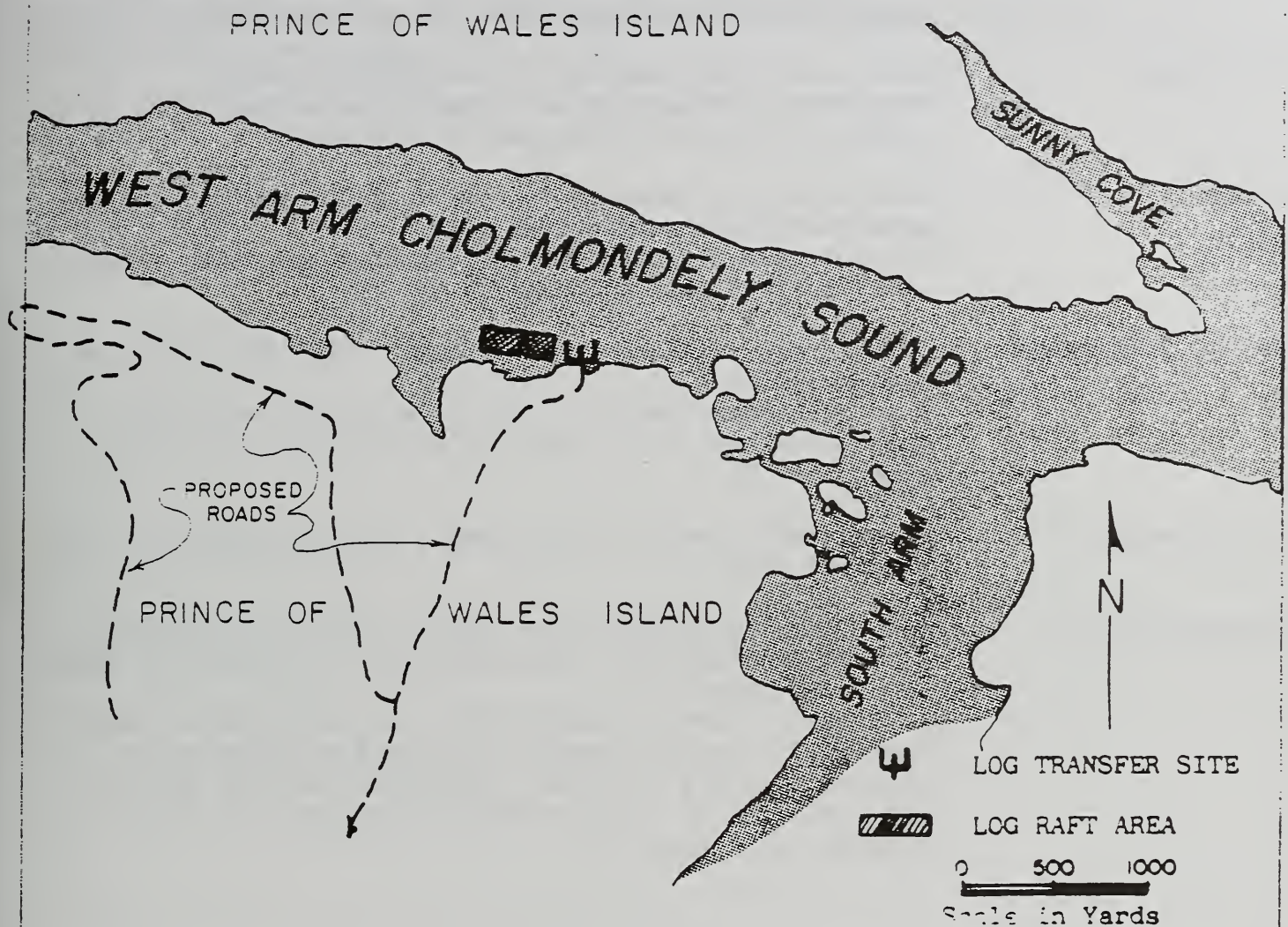






# CHOLMONDELY #6

## PROPOSED L.T.F.



### ALTERNATIVE

|                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|---|---|---|---|---|---|---|---|
| Used           |   | X |   |   | X |   |   |   |
| Reconstruction |   |   |   |   |   |   |   |   |
| SYSTEM TYPE    |   |   |   |   |   |   |   |   |
| Double A-Frame |   |   |   |   |   |   |   |   |
| Slide          |   | X |   |   | X |   |   |   |
| Float-Off      |   |   |   |   |   |   |   |   |



West Arm Cholmondeley #6

- Legal Location:
- NE1/4SE1/4, Sec.27, T.76S.R.86E., CRG A-1.
  - Latitude 55° 14' 53" N Longitude 132° 18' 55" W
- Operations:
- Site is suitable for an A-frame facility.
  - Rafting and booming of logs is possible on the south side of West Arm Cholmondeley near the proposed site.
- Development:
- Rock source for facility is available on site.
  - Beachhead mobilization will need to be accomplished in a shallow area just to the west of the site.
- Access:
- Road access is intended to come from the west around the abandoned Cholmondeley town site.
  - Route location around the Cholmondeley town site should avoid private land holdings in the cove.
- Marine Conditions:
- Site is acceptable by the NMFS and USF&WS for use as an A-frame site.
  - Site bathymetry exhibits good flushing and excellent depth in front of the wall and no conflicts with site productivity.
- Environmental:
- There are no conflicts with eagle nesting habitat at the proposed site.
- Recommendations:
- Since this site access the timber on the south side of West Arm Cholmondeley from Big Creek to the west to South Arm to the east.
  - In order to harvest timber from this area without this facility, it would require a road and a bridge to be built across Big Creek and traverse a vertical wall on the east side of the Big Creek outlet which would be prohibitively expensive.

## LOG TRANSFER SITE EVALUATION

New log transfer sites were selected and evaluated with respect to the interagency Log Transfer Siting Guidelines. Additionally, these guidelines were applied to the existing log transfer sites to examine their suitability under current guidelines.

Following are evaluations of the individual sites in accordance with the interagency siting guidelines.

SITE NAME: Cholmondeley (West Arm #6)

TLMP VCU NO: 674

CORPS OF ENGINEERS PERMIT ID:

SITE STATUS: Proposed

| GUIDELINE<br>ID | ATTF<br>GUIDELINES   | EVALUATION OF SITE<br>AGAINST GUIDELINES   |
|-----------------|--|--|
| S1              | <u>Proximity to Rearing and Spawning Areas:</u> Siting of log transfer and log raft storage facilities within 300 feet of the mouths of anadromous fish streams, or in areas known to be important for fish spawning or rearing, is normally prohibited.                     | Meets this guideline.  |
| S2              | <u>Protected Locations:</u> Log transfer and log raft storage facilities should be sited in weather protected waters with bottoms suitable for anchoring and with at least 20 acres for temporary log storage and log booming.   | Ample rafting area. Bottom unknown. Protected from the weather.  |
| S3              | <u>Upland Facility Requirements:</u> Log Transfer Facilities (LTF) generally should be sited in proximity to at least 5 acres of relatively flat uplands. There should also be a body of water sufficient to provide a minimum of 60 lineal foot facility face.              | Sufficient upland area for small sort area. Sufficient facility face available.  |
| S4              | <u>Safe Access to a Facility from the Uplands:</u> To provide safe access to the LTF adjoining log sort yard, the facility should be sited where access roads to the facility can maintain a grade of 10 percent or less for trucks and 4 percent for specialized equipment. | Moderate approach grades to site.  |
| S5              | <u>Bark Dispersal:</u> LTFs should be sited along or adjacent to straits and channels or deep bays where currents may be strong enough to disperse sunken or floating wood debris. Siting LTFs in embayments   | Site has good dispersal characteristics. Site has very steep shore and is adjacent to very deep channel. Site has good tidal currents. |



| GUIDELINE<br>ID | ATTF<br>GUIDELINES   | EVALUATION OF SITE<br>AGAINST GUIDELINES                          |
|-----------------|--|---|
|                 | with sills or other natural restrictions to tidal exchange should be avoided.  |   |
| S6              | <u>Site Productivity</u> : Sites for in-water storage and/or transfer of logs should be located in areas having the least productive intertidal and subtidal zones.  | Estimated ranges of impact:<br>Low is 1; High is 10<br><br>1      |
| S7              | <u>Sensitive Habitats</u> : LTFs and log raft storage areas should not be sited on or adjacent to (i.e., near enough to effect) extensive tideflats, salt marches, kelp or eelgrass beds, seaweed harvest areas, or shellfish concentration areas.                                 | Estimated ranges of impact:<br>Low is 1; High is 10<br><br>1      |
| S8              | <u>Safe Marine Access to Facilities</u> : Log rafting and storage facilities should be safely accessible to tug boats with log rafts at most tides and on most winter days.  | True of this site.  |
| S9              | <u>Storage and Rafting</u> Logs, log bundles, or log rafts should be stored in areas where they will not ground at low tide. A minimum depth of 40 feet or deeper measured at Mean Lower Low Water (MLLW) for log raft storage is preferred.                                       | Ample water depth.  |
| S10             | <u>Avoid Bald Eagle Nest Trees</u> : Site LTFs to avoid bald eagle nests. No project construction or operations should be closer than 330 feet to any bald eagle nest tree.  | No nest trees.  |
| C1              | <u>LTF Design</u> : LTF design should be the least environmentally damaging, practicable alternative. Factors to be considered in selection of design alternatives include: 1) economic practicality; 2) facility requirements; 3) physical site constraints; 4) timber volumes to | Site has suitable characteristics for an A-frame life off system. |

| GUIDELINE<br>ID | ATTF<br>GUIDELINES   | EVALUATION OF SITE<br>AGAINST GUIDELINES |
|-----------------|--|--|
|                 | be transferred (site usage and duration); 5) total potential effects on biota and water quality (including biological productivity and sensitivity); and 6) other potential uses of the site and facility.   |  |
| C2              | <u>Fill Structures:</u> Fill structures shall be designed and constructed to prevent erosion, pollution, and structural displacement.  |  |
| C3              | <u>Timing of In-water Construction:</u> In-water construction, blasting, and/or filling associated with LTF sites should be timed to limit adverse impacts to marine and estuarine fishery resources and avoid conflicts with other user groups.                                     |  |
| C4              | <u>Bark Accumulation Management:</u> The siting, design, and operation of the LTF and contiguous collateral upland facilities shall utilize best practicable procedures and methodologies to control intertidal and submarine accumulations of bark.                                 |  |
| C5              | <u>Solid Waste Management:</u> Solid waste including wood and other solid waste generated from the LTF, contiguous and other collateral facilities shall be routinely removed from the LTFs and adjacent facilities and disposed of at an approved upland solid waste disposal site. |  |
| C6              | <u>Bark Accumulation:</u> The regulatory agency(ies) will impose an interim intertidal and submarine threshold bark accumulation level. When accumulations exceed the threshold level, cleanup--if any--will occur   |  |

| GUIDELINE<br>ID | ATTF<br>GUIDELINES   | EVALUATION OF SITE<br>AGAINST GUIDELINES                         |
|-----------------|--|--|
|                 | at the discretion of the permitting agency(ies). The interim threshold bark accumulation level is described as 100 percent coverage exceeding both 1 acre in size and a thickness greater than 10 cm (3.9 inches) at any point.  |  |
| C7              | <u>Bundle Speed</u> : The speed of log bundles entering receiving waters should be the slowest practicable speed achievable. Decisions on the allowable transfer system that can be used will occur on a site-specific basis during the permitting process.  | Entry velocity will be controlled by the operator and equipment. |
| C8              | <u>Surface Drainage Management</u> : The design, construction, and operation of LTFs, contiguous sort yards, and/or log storage yards shall utilize practicable procedures for control of surface water runoff from facilities.  |  |
| C9              | <u>Control of Hydrocarbons</u> : The log transfer system and adjacent sort yard handling equipment shall be operated and maintained to minimize petroleum and lubricating products from entering waters.   |  |
| C10             | <u>On-shore Log Storage</u> : Where feasible, preference must be given to on-shore storage and barging of logs.  |  |
| C11             | <u>Facility Maintenance and Reclamation</u> : The permittee shall maintain the structure or work authorized in good condition and in reasonable accordance with the approved plans and drawings. If and when the permittee desires to abandon the authorized activity herein, unless such abandonment is part of a transfer procedure by |  |



| GUIDELINE<br>ID | ATTF<br>GUIDELINES | EVALUATION OF SITE<br>AGAINST GUIDELINES |
|-----------------|--------------------|--|
|-----------------|--------------------|--|

which the permittee is transferring its interests to a third party, the permittee must restore the area to a satisfactory condition.

# ALASKA TIMBER TASK FORCE

## SITING GUIDELINES

### LOG TRANSFER SITE EVALUATION

Log transfer sites were selected and evaluated with respect to the interagency Log Transfer Siting Guidelines. Following are the siting guidelines used to evaluate both new and existing Log Transfer Sites.

#### SITING GUIDELINES

**Proximity to Rearing and Spawning Areas:** Siting of log storage and transfer facilities within 300 feet of mouths of anadromous fish streams or in areas known to be important for fish spawning or rearing is normally prohibited.

**Protected Locations:** Log transfer and log raft storage facilities should be sited in weather protected waters with bottoms suitable for anchoring and at least 20 acres for temporary log storage and booming.

**Upland Facility Requirements:** Log transfer facilities should be sited near at least five acres of relatively flat uplands. There should also be a body of water sufficient to provide a minimum of 60 linear foot facility face.

**Safe Access to a Facility From the Uplands:** To provide safe access to the log transfer facility and adjoining log sort yard, the facility should be sited where access roads can maintain a grade of 10 percent or less for trucks and four percent specialized equipment.

**Bark Dispersal:** Log transfer facilities should be sited along or adjacent to straits and channels or deep bays where currents may be strong enough to disperse sunken or floating wood debris. Siting log transfer facilities in embankments with sills or other natural restrictions to tidal exchange should be avoided.

**Site Productivity:** Sites for in-water storage and/or transfer of logs should be located in areas having the least productive inter-tidal and sub-tidal zones.

**Sensitive Habitats:** Log transfer facilities and log raft storage areas should not be sited on or adjacent to extensive tide flats, flat marshes, kelp, or eel grass beds, seaweed harvest areas, or shellfish concentration areas.

**Safe Marine Access to Facilities:** Log rafting and storage facilities should be accessible to tug boats with log rafts at most tides and on most days.

**Storage and Rafting:** Logs, log bundles, or log rafts should be stored in areas where they will not ground at low tide. A minimum depth of forty feet or deeper, measured at mean lower low water (MLLW), for log raft storage is preferred.

**Avoid Bald Eagle Nest Trees:** Site log transfer facilities to avoid bald eagle nests. No project construction or operations should be closer than 330 feet to any bald eagle nest tree.

Additional interagency guidelines concerning LTF site construction and monitoring are included in Appendix E.

Existing sites were examined in accordance with the interagency siting guidelines to evaluate current adequacy. The existing sites do not necessarily meet all guides. For instance, several sites within the Project Area may be located within 300 feet of an anadromous fish stream.

An additional log transfer siting guideline dealing with recreation and visual considerations is as follows: log transfer facilities should be located where conflicts with existing boat anchorages will be minimized and views of the facility will be considered as seen from travel routes and use areas.





U.S. Department of the Interior  
Fish and Wildlife Service  
Fish and Wildlife Enhancement  
Juneau, Alaska

and

U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Habitat Conservation Division  
Juneau, Alaska

Report of Field Investigations

Cleveland Peninsula: Pt. Francis, Port Stewart; Prince  
of Wales Island: Twelvemile Arm, Hollis are, McKenzie Inlet  
Sunny Point, West Arm Cholmondeley Sound: Dall Island: North Bay,  
Meares Passage: Sumez Island: Pts. Remedios/Barrigon, Port Delores  
for the U.S. Forest Service.

Trocadero Bay and San Juan Batista Island for Shaan-Seet Inc.

June 15-22, 1986

In response to request from the U.S. Forest Service and Shaan-Seet Inc., personnel from the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), the Alaska Department of Fish and Game (ADF&G), the U.S. Forest Service, (USFS), Corps of Engineers and Shaan-Seet Inc. investigated, in concert, a number of proposed sites to determine their suitability as locations for log transfer facilities. The FWS vessel, the M/V Curlew served as base of operations for the investigations.

Over the years the timber industry has employed the technique of dumping logs in marine waters, constructing rafts, storing the rafts and towing rafts to processing centers. While it is not obvious, there is a significant bark loss resulting from the above activities. What happens to the bark lost is dependent on numerous variables, but most often bark is found to accumulate in areas of high log handling activity in quantities sufficient to smother bottom dwelling organisms. There have been two generic approaches to lessening the harmful effects of concentrated bark deposits -- (1) to choose sites which will facilitate bark dispersal and (2) to choose sites from which there is less production to be lost. Our site selection techniques are designed to consider each approach, and sometimes both approaches.

Factors other than intertidal and subtidal habitat considerations also enter into site selection. Protection from weather and engineering feasibility are two important examples which must be considered. It is our experience that the site selection process is facilitated if representatives from all interested parties are onsite to address conflicts and ultimately come to agreement on the site. Such multidisciplinary investigations usually reduce

the overall effort expended on the project by all interest groups and increase the rapport between these interest groups. During this field effort Chuck Osborn, Everett Robinson-Wilson and Andy Grossman represented the U.S. Fish and Wildlife Service; Tamra Faris and Duane Petersen represented the National Marine Fisheries Service; Bob Varner represented the U.S. Forest Service; Bill Fowler represented the Corps of Engineers; Jack Gustafson represented Alaska Department of Fish and Game; Les Christain and Clare Doig represented Shaan Seet, Inc.

### OBJECTIVES

1. Investigate subtidal habitat at potential transfer sites to determine a) the physical characteristics consisting of depth, slope, substrate, and current patterns: and b) the biological characteristics of productivity and diversity.
2. Pursue comparative subtidal investigations of proposed alternatives if original proposal proves undesirable to one or more interest groups.
3. Resolve, to the extent possible, which site is the most acceptable to all the interests in concert, and to discuss any mitigation which may be appropriate.

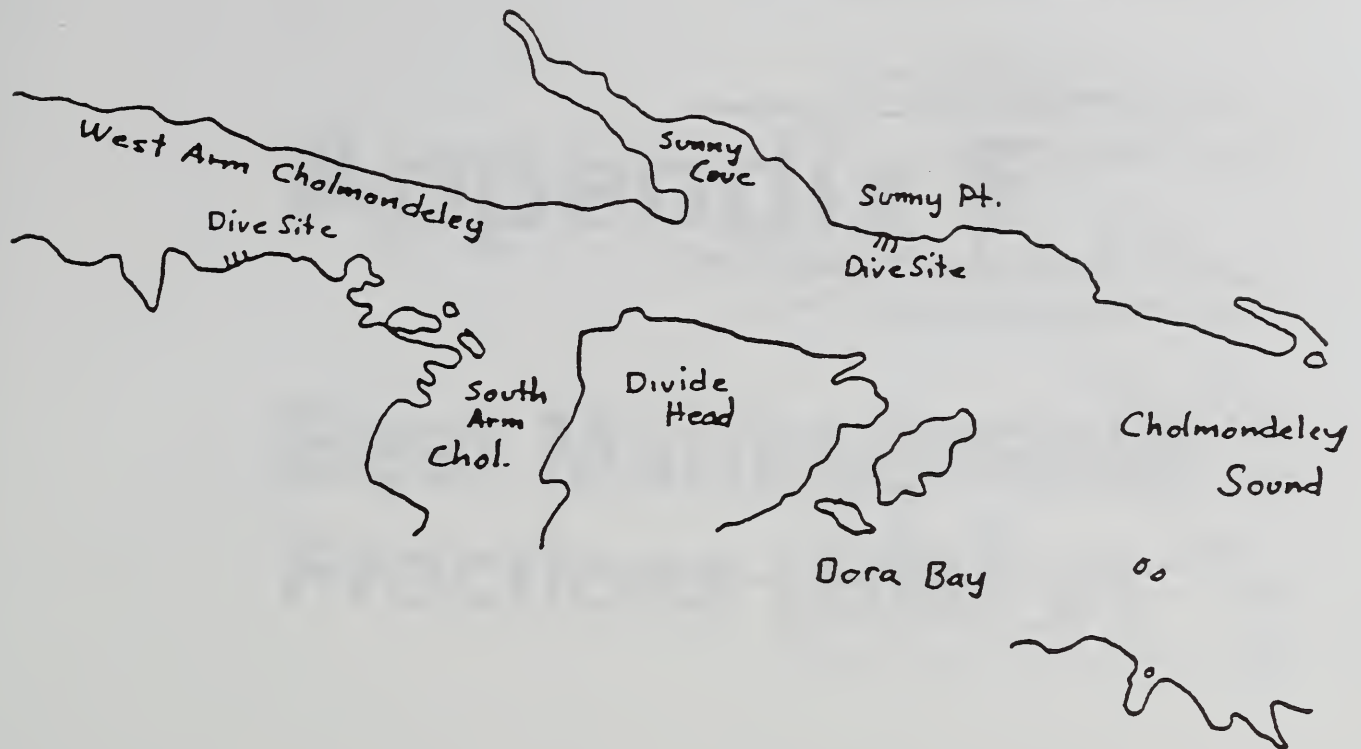
### METHODS

The methods described here relate only to the subtidal portion of the investigations. A portable depth sounder was used to obtain preliminary information relative to the slope of proposed sites. At most sites SCUBA was employed to obtain the bulk of the underwater data. A transect line 100 meters long was usually attached to the shore near the high water mark and extended seaward at a right angle to the shore at the proposed transfer site. Observations of physical and biological characteristics were made at five or ten meter intervals along the transect. The observations included water depth, substrate composition, plant species, animal species, and obvious changes in zonation which were recorded on underwater paper. Existing water currents and evidence of current flow patterns were noted in a subjective manner by each observer.

### RESULTS AND RECOMMENDATIONS

Following are location maps, bottom profiles, and a discussion, including recommendations for each area visited. Species observed in each area are displayed in Table 1. However, only cursory dives were accomplished in Cholmondeley Sound. Therefore, species were not recorded and, as such, are not included in Table 1.

CHOMONDELEY SOUND. June 17, 1986. No transects.



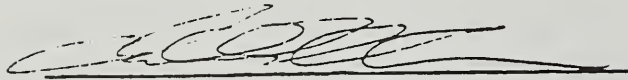
A pod of four humpback whales were present and feeding in Dora Bay while we were anchored there. Two of the adults were identified by fluke photographs obtained by the National Marine Fisheries Service biologist.

West Arm - Soundings at this site revealed an extremely steep and deep slope with an excess of 16 fathoms in depth just 10 meters from shore. Sites exhibiting such a slope profile must be considered as one of the very best locations for log transfer activities because of the potential for bark dispersal and a small productive zone (i.e. the zone between the surface and about 40-45 feet in depth). Subtidal dives were made from three points along the shoreline. The shoreline drops off steeply along a rock-like cliff which was densely covered by Agarum sp. algae to a depth of 30 feet. Invertebrates, such as sea cucumbers, seastars, snails, and small crabs were common among the algae. At the -40 foot depth, algae and large invertebrates were not present. The bottom which sloped off more gradually at about -80 feet appeared composed of sand and broken shells. Adverse impacts from bark deposition and log transfer would be minimal at this site. From an intertidal/subtidal bottom ecology standpoint, this site is suitable for log transfer activity.

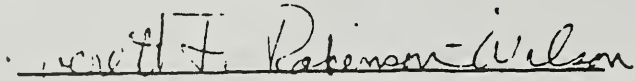
Sunny Pt. - While there is not a current proposal for a log transfer facility at this location, a proposal has existed in the past and may well exist in the future. Upon request, we made a cursory investigation of the site. We found the area to be highly productive (Agarum sp., many bottomfish, and abundant large invertebrates) and diverse with a series of rock shelves which would likely trap significant pockets of bark debris. As such, we would not recommend this site for log transfer activity.



U.S. Fish and Wildlife Service



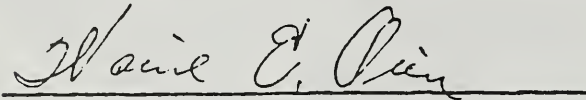
Charles Osborn, diver



Everett Robinson-Wilson, diver

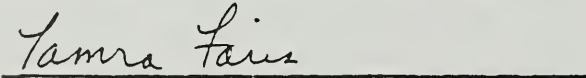


Andy Grossman, diver

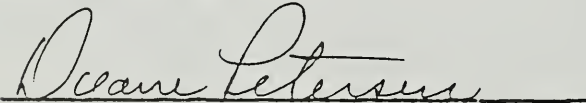


Waine Oien, Field Supervisor  
Fish and Wildlife Enhancement

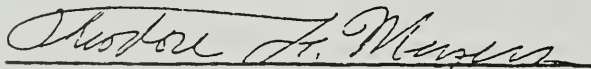
National Marine Fisheries Service



Tamra Faris, diver



Duane Petersen, diver



Theodore F. Meyers, Chief  
Habitat Conservation Division

# **Appendix F**

## **Best Management Practices (BMPs)**

# Appendix 3

Best Management Practices (BMPs)



## APPENDIX F

### BEST MANAGEMENT PRACTICES

The Clean Water Act of 1972 (Public Law 92-500), as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4), has the objective to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The Act provides a means to protect and improve the quality of the water resources and maintain their beneficial uses. Sections 208 and 319 of The Clean Water Act recognizes the need for control strategies for nonpoint source pollution.

To provide environmental protection and improvement emphasis for water and soil resources and water-related beneficial uses, the National Nonpoint Source Policy (December 12, 1984), the Forest Service Nonpoint Strategy (January 29, 1985), and the USDA Nonpoint Source Water Quality Policy (December 5, 1986) were developed. Best Management Practices (BMPs) were recognized as the primary control mechanisms for nonpoint sources of pollution on National Forest System lands.

In order to comply with State water quality standards, the Forest Service applies BMPs that are "consistent" with the Alaska Forest Resources and Practices Act (1990) and other applicable State water quality regulations. In recognition of the importance of BMPs, they are identified as one portion of the "Forest Service Alaska Region Water Quality Management Plan," as described in the USDA Forest Service/Alaska Department of Environmental Conservation Memorandum Of Agreement (1992).

Best Management Practices may be defined as: land management methods, measures or practices intended to minimize or reduce water pollution including, but not limited to, structural and nonstructural controls, operation and maintenance procedures, other requirements, and scheduling and distribution of activities. The site-specific application of the BMPs is designed with the consideration of geology, land type, hydrology, soil type, erosion hazard, climate, cumulative effects, and other factors in order to fully protect and maintain soil, water, and water-related beneficial uses, and to prevent or reduce nonpoint source pollution.

Direction for the use of BMPs on National Forest System lands in Alaska is included in Chapter 10 of FSH 2509.22, The Soil and Water Conservation Handbook. The handbook describes the application, monitoring, evaluation, and refinement of these BMPs. The following list is a summary of the BMPs, and includes the practice number (from the Soil and Water Conservation Handbook), name, and objective of the Best Management Practices used in the Alaska Region.

| No.   | PRACTICE   | OBJECTIVE  |
|-------|--|--|
| 12.1  | Cumulative Watershed Effects Analysis                        | To determine the Cumulative Watershed Effects (CWE) on the beneficial uses of water caused by multiple land management activities, distributed over both time and space.   |
| 12.2  | Soil and Water Resource Monitoring and Evaluation            | To determine the effects of land management activities on water quality through a well planned, coordinated, and executed monitoring program; to ensure the health and safety of water users; to evaluate BMP effectiveness; and to determine the adequacy of data, assumptions, and coefficients in the Forest Plans. |
| 12.3  | Watershed Improvement Planning and Implementation            | To improve degraded watershed conditions, to minimize soil erosion, and to improve water availability or quality.  |
| 12.4  | Floodplain Analysis and Evaluation                           | To protect floodplain values and avoid, where possible, the long and short-term adverse impacts to soil and water resources associated with the occupancy and modification of floodplains.   |
| 12.5  | Wetlands Analysis and Evaluation                             | To maintain wetland functions and avoid adverse soil and water resource impacts associated with the destruction or modification of wetlands.   |
| 12.6  | Riparian Area Designation and Protection                     | To maintain and protect water quality and fisheries habitat, and to minimize adverse effects on riparian areas from logging and other land disturbing management activities.   |
| 12.7  | Streambank Protection  | To minimize sediment production from streambanks and structural abutments in natural waterways.  |
| 12.8  | Oil Pollution Prevention and Servicing/Refueling Operations  | To prevent contamination of surface and subsurface soil and water resources from spills of petroleum products.   |
| 12.9  | Oil and Hazardous Substances Pollution Contingency Planning. | To minimize contamination of waters from accidental spills of oil and hazardous substances by use of appropriate contingency plans.  |
| 12.10 | Control of Activities Under Special Use Permit               | To protect surface and subsurface soil and water resources from physical, chemical, and biological pollutants resulting from activities that are under special-use permit.   |
| 12.11 | Management by Closure to Use                                 | To exclude activities that could result in significant damage to facilities which would result in impaired water quality.  |
| 12.12 | Water Well Construction and Management                       | To protect ground water resources from contamination transmitted from water well developments.   |



| No.   | PRACTICE  | OBJECTIVE  |
|-------|---|--|
| 12.13 | Administrative Site Planning and Management                                   | To locate, design, and manage administrative sites to prevent water pollution and other adverse environmental and health impacts.  |
| 12.14 | Planning, Design and Management of Utility Corridors                          | To assure that construction and maintenance of powerlines and pipelines are accomplished in a manner that minimize effects on water quality.   |
| 12.15 | Management of Sanitary Facilities and Sanitary Guidelines for Temporary Camps | To prevent water pollution and health risks from the disposal of sewage at Forest Service Facilities, facilities under special use permit, and temporary camps of all types.                       |
| 12.16 | Control of Solid Waste Disposal   | To protect surface and subsurface soil and water resources from nutrients, bacteria, and chemicals associated with solid waste disposal.   |
| 12.17 | Revegetation of Disturbed Areas   | To protect water quality by minimizing soil erosion.   |
| 13.1  | Timber Sale Planning  | To incorporate soil and water resource considerations into Timber Sale Planning.   |
| 13.2  | Timber Harvest Unit Design  | To ensure that timber harvest unit design will secure favorable conditions of water flow, or maintain water quality and soil productivity, and minimize soil erosion and sedimentation.            |
| 13.3  | Designating Water Quality Protection Needs on Sale Area/Unit Release Maps     | To delineate the location of protection areas and to ensure their recognition, proper consideration, and protection on the ground.   |
| 13.4  | Limiting the Operating Period of Timber Sale Activities                       | To minimize soil erosion and sedimentation by ensuring the Purchaser conducts operations, including erosion control work and road maintenance, in a timely manner.                                 |
| 13.5  | Protection of Potentially Unstable Areas                                      | To protect potentially unstable areas and to avoid triggering mass movements of the soil mantle and resultant erosion and sedimentation.   |
| 13.6  | Determining Suitability for Tractor Logging                                   | To protect water quality from degradation by identifying those areas where tractor yarding techniques are appropriate, and by establishing guidelines for the yarding operation.                   |
| 13.7  | Determining Suitability for Shovel Logging                                    | To protect soil resources and water quality from degradation by identifying those areas where shovel yarding techniques are appropriate, and by establishing guidelines for the yarding operation. |
| 13.8  | Protection of Alluvial Soils With Shallow Organic Layers                      | To protect alluvial soils and the overlying organic layer to maintain soil productivity.   |



| No.   | PRACTICE  | OBJECTIVE   |
|-------|---|---|
| 13.9  | Suspended Log Yarding in Timber Harvesting                            | To protect water quality by protecting the soil from excessive disturbance and accelerated erosion and to maintain the integrity of the riparian area and other sensitive watershed areas where it is determined that ground-based machinery is inappropriate.  |
| 13.10 | Log Landing Location and Design for Erosion Control                   | To design and construct landings to minimize soil erosion and water quality degradation.  |
| 13.11 | Erosion Prevention and Control Measures During Timber Sale Operations | To ensure that the Purchaser's operations shall be conducted reasonably to minimize soil erosion and water quality degradation.   |
| 13.12 | Revegetation of Areas Disturbed by Harvest Activities                 | To establish a vegetative cover on disturbed sites to minimize erosion and sedimentation.   |
| 13.13 | Erosion Control Structure Maintenance                                 | To ensure that constructed erosion control structures are stabilized and working effectively.   |
| 13.14 | Acceptance of Erosion Control Measures Before Sale Closure            | To assure the adequacy of required erosion control work on timber sales.  |
| 13.15 | Wetland Protection During Timber Harvest                              | To avoid damage to the ground cover, soil, and water quality in wetlands during timber harvest.   |
| 13.16 | Stream Channel Protection (Implementation and Enforcement)            | 1) To protect the natural flow of streams; (2) to provide unobstructed passage of stormflows; (3) to reduce sediment and other pollutants from entering streams; and (4) to restore the natural course of any stream as soon as practicable, if the stream is diverted as a result of timber management activities, (5) to maintain channel integrity and stability for protection of aquatic habitat and other beneficial uses, and (6) to avoid adverse changes in the natural stream temperature regime. |
| 13.17 | Nonrecurring "C" Provisions For Soil and Water Quality Protection     | To insert nonrecurring (Special) "C" provisions into the Timber Sale Contract to protect soil and water resources, where standard "B" or "C" provisions do not apply or are inadequate to protect watershed values.   |
| 13.18 | Modification of the Timber Sale Contract                              | To seek an Environmental Modification of the timber sale contract if new circumstances or conditions indicate that the timber sale will cause irreparable damage to soil, water, or watershed values.   |
| 13.19 | Reforestation Requirement   | To promote prompt reforestation and to mitigate watershed disturbance on areas with limited regeneration potential.   |

| No.   | PRACTICE  | OBJECTIVE  |
|-------|---|--|
| 14.1  | Transportation Planning   | To assure soil and water resource considerations in Transportation Planning activities.  |
| 14.2  | Location of Transportation Facilities   | To locate roads and trails with minimal soil and water resource impact.  |
| 14.3  | Design of Transportation Facilities   | To design roads and trails with minimal soil and water resource impact.  |
| 14.4  | Location and Design of Log Transfer Facilities (LTF's).                         | To locate and design LTF's with minimal soil, water and biological impact.   |
| 14.5  | Road and Trail Erosion Control Plan   | Design to minimize and mitigate erosion, sedimentation, and resulting water quality degradation prior to the initiation of construction and maintenance activities. Ensure compliance through effective contract administration and timely implementation of erosion control measures. |
| 14.6  | Timing Restrictions for Construction Activities                                 | Where effective minimize erosion by conducting operations during low risk periods.   |
| 14.7  | Slope Stabilization to Minimize Mass Failures                                   | To reduce sedimentation by minimizing the chances for road-related mass failures, including landslides and embankment slumps.  |
| 14.8  | Slope Stabilization to Minimize Surface Erosion                                 | To minimize soil erosion from cutslopes, fillslopes, and the travelway.  |
| 14.9  | Control of Road Drainage  | To minimize the erosive effects of concentrated water and the degradation of water quality by proper design and construction of road drainage systems and drainage control structures.   |
| 14.10 | Pioneer Road Construction   | To minimize sediment production associated with pioneer road construction.   |
| 14.11 | Timely Erosion Control Measures on Incomplete Roads and Streamcrossing Projects | To minimize erosion of and sedimentation from disturbed ground on incomplete projects.   |
| 14.12 | Control of Excavation and Sidecast Material                                     | To reduce sedimentation from unconsolidated excavated and sidecast material caused by road construction, reconstruction, or maintenance.   |
| 14.13 | Control of Construction in Riparian Areas                                       | To minimize the adverse effects of road and trail construction on riparian areas.  |
| 14.14 | Control of In-Channel Operations  | To minimize stream channel disturbances and related sediment production.   |



| No.   | PRACTICE  | OBJECTIVE  |
|-------|---|--|
| 14.15 | Diversion of Flows Around Construction Sites            | To minimize downstream sedimentation.  |
| 14.16 | Streamcrossings on Temporary Roads                      | To prevent temporary roads from damaging streamcourses, degrading water quality, or obstructing fish passage.  |
| 14.17 | Bridge and Culvert Design and Installation              | To minimize the impact on water quality and fisheries resources from the installation of bridges and culverts.   |
| 14.18 | Development of Borrow Pits, Gravel Sources and Quarries | To minimize sediment production from borrow pits, gravel sources, and quarries, and limit channel disturbance in those gravel sources suitable for development in floodplains. |
| 14.19 | Disposal of Right-of-Way and Roadside Debris            | To ensure that debris generated during road construction is kept out of streams and to prevent slash and debris from subsequently obstructing channels.                        |
| 14.20 | Road Maintenance  | To maintain all roads in a manner which provides for soil and water resource protection by minimizing rutting, failures, sidecasting, and blockage of drainage facilities.     |
| 14.21 | Road Surface Treatment to Prevent Loss of Materials     | To minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production.   |
| 14.22 | Access and Travel Management                            | Reduce the potential for erosion and sedimentation from road surface disturbance during periods of high runoff and spring thaw conditions.                                     |
| 14.23 | Snow Removal Controls                                   | To minimize the impact of snow melt on road surfaces and embankments and to reduce the probability of sediment production resulting from snow removal operations.              |
| 14.24 | Obliteration of Temporary Roads                         | To reduce sediment generated from temporary roads and return land to production by obliterating them at the completion of their intended use.                                  |
| 14.25 | Surface Erosion Control at Facilities                   | To minimize the amount of erosion and sedimentation at facilities.   |
| 15.1  | Pesticide Use Planning                                  | To incorporate water quality and hydrologic considerations into the Pesticide Use Planning Process.  |
| 15.2  | Follow Pesticide Label and EPA Registration Directions  | To prevent water contamination and risk to humans from pesticide application, cleaning of equipment, and disposal of pesticide containers.                                     |
| 15.3  | Pesticide Application Monitoring and Evaluation         | To determine and document that pesticides have been applied safely and to provide an early warning for any contamination of water or non-target areas or resources.            |



| No.  | PRACTICE  | OBJECTIVE  |
|------|---|--|
| 15.4 | Pesticide Spill Contingency Planning  | To reduce contamination of water from accidental pesticide spills.   |
| 15.5 | Protection of Water Quality, Wetlands, and Riparian Areas During Pesticide Application            | To minimize the risk of pesticide contamination of surface or subsurface waters, riparian areas, wetlands, and other non-target areas.   |
| 16.1 | Recreation Facilities Planning  | To protect soil and water resources through appropriate planning, design and location of recreational facilities.  |
| 16.2 | Providing Safe Drinking Water Supplies  | To protect water quality and provide safe drinking water to Forest Service facilities such as campgrounds, picnic grounds, trailheads, Visitor Information Centers, winter sport areas, and developed roadside facilities. |
| 16.3 | Assuring Proper Sanitation and Water Supplies For Special Use Facilities and Administrative Sites | To protect the quality of water both consumed by and discharged from facilities under Special Use Permit, and from administrative sites not on public water and sewer systems.   |
| 16.4 | Trail Construction and Maintenance  | To minimize soil erosion and water quality problems originating from trails and their drainage structures.   |
| 16.5 | Management of Off-Road Vehicle Use  | To control Off-Road Vehicle (ORV) use which is causing soil erosion and adverse effects on water quality and to identify corrective measures.  |
| 16.6 | Protection of Water Quality Within Developed Recreation Areas                                     | To protect water quality by regulating the discharge and disposal of potential pollutants.   |
| 16.7 | Protection of Water Quality Within Dispersed Recreation Areas                                     | To avoid slope erosion and trampling in riparian and wetland areas, and consequent loss of vegetation and degradation of water quality.  |
| 17.1 | Mining Site Conditions, Planning, and Design  | To incorporate soil and water resource considerations into the planning process for mining and mineral exploration operations.   |
| 17.2 | Placer Mining   | To incorporate soil and water resource considerations into the planning process for mining plans of operation for placer mining.   |
| 17.3 | Hard Rock Mining  | To incorporate soil and water resource considerations into the planning process for mining plans of operation for lode mining operations.  |

| No.   | PRACTICE  | OBJECTIVE  |
|-------|---|--|
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| 14.19 | Disposal of Right-of-Way and Roadside Debris            | To ensure that debris generated during road construction is kept out of streams and to prevent slash and debris from subsequently obstructing channels.                        |
| 14.20 | Road Maintenance  | To maintain all roads in a manner which provides for soil and water resource protection by minimizing rutting, failures, sidecasting, and blockage of drainage facilities.     |
| 14.21 | Road Surface Treatment to Prevent Loss of Materials     | To minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production.   |
| 14.22 | Access and Travel Management                            | Reduce the potential for erosion and sedimentation from road surface disturbance during periods of high runoff and spring thaw conditions.                                     |
| 14.23 | Snow Removal Controls                                   | To minimize the impact of snow melt on road surfaces and embankments and to reduce the probability of sediment production resulting from snow removal operations.              |
| 14.24 | Obliteration of Temporary Roads                         | To reduce sediment generated from temporary roads and return land to production by obliterating them at the completion of their intended use.                                  |
| 14.25 | Surface Erosion Control at Facilities                   | To minimize the amount of erosion and sedimentation at facilities.   |
| 15.1  | Pesticide Use Planning                                  | To incorporate water quality and hydrologic considerations into the Pesticide Use Planning Process.  |
| 15.2  | Follow Pesticide Label and EPA Registration Directions  | To prevent water contamination and risk to humans from pesticide application, cleaning of equipment, and disposal of pesticide containers.                                     |
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| No.  | PRACTICE  | OBJECTIVE  |
|------|---|--|
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| 16.3 | Assuring Proper Sanitation and Water Supplies For Special Use Facilities and Administrative Sites | To protect the quality of water both consumed by and discharged from facilities under Special Use Permit, and from administrative sites not on public water and sewer systems.   |
| 16.4 | Trail Construction and Maintenance  | To minimize soil erosion and water quality problems originating from trails and their drainage structures.   |
| 16.5 | Management of Off-Road Vehicle Use  | To control Off-Road Vehicle (ORV) use which is causing soil erosion and adverse effects on water quality and to identify corrective measures.  |
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| 17.2 | Placer Mining   | To incorporate soil and water resource considerations into the planning process for mining plans of operation for placer mining.   |
| 17.3 | Hard Rock Mining  | To incorporate soil and water resource considerations into the planning process for mining plans of operation for lode mining operations.  |



| No.  | PRACTICE   | OBJECTIVE  |
|------|--|--|
| 17.4 | Permits and Administration of Geophysical Operations   | To protect the quality of surface and ground water from degradation resulting from geophysical activities on National Forest System lands.   |
| 17.5 | Site Closure and Rehabilitation  | To incorporate soil and water resource considerations into the planning process for mining plans of operation  |
| 17.6 | Abandoned Mine Land Reclamation  | To reduce erosion and water quality degradation by sediment and toxic substances from abandoned mined lands and mining facilities through reclamation of these lands.                |
| 18.1 | Fish and Wildlife Habitat Improvement Planning   | To incorporate soil and water resource considerations into planning for fish and wildlife improvement projects.  |
| 18.2 | Development of Groundwater-fed Spawning and Rearing Habitat from Gravel Extraction and Other Sites | To minimize sediment production from gravel extraction and/or ground reshaping during and following construction of groundwater-fed spawning and rearing streams and ponds.          |
| 18.3 | In-Channel Excavation or Disturbance During Fish and Wildlife Habitat Improvement Projects         | To minimize stream channel disturbances and related sediment production during and after development of fish and wildlife habitat improvement projects.                              |
| 18.4 | Ground Fertilization for Wildlife Habitat Improvement  | To minimize impacts to water quality in stream systems and lakes within and adjacent to areas being fertilized.  |
| 18.5 | Lake Fertilization for Fish Habitat Improvement  | To limit eutrophication in Forest lakes.   |
| 19.1 | Fire and Fuel Management Activities and Prescriptions  | To reduce flooding and erosion by reducing the frequency, intensity, and destructiveness of wildfire.  |
| 19.2 | Protection of Water Quality Through Prescribed Burning Prescriptions                               | To maintain soil productivity, minimize erosion, and prevent ash, sediment, nutrients, and debris from entering surface waters, through the formulation of the burning prescription. |
| 19.3 | Minimizing Watershed Impacts from Fire Suppression Efforts   | To avoid watershed impacts in excess of that which would be caused by the fire itself.   |
| 19.4 | Stabilization of Fire Suppression Related Watershed Damage   | To stabilize all areas that have had their erosion potential significantly increased, or their drainage pattern altered by suppression related activities.                           |
| 19.5 | Emergency Watershed Rehabilitation Following Wildfires   | To minimize the loss of soil and on-site productivity, the deterioration of water quality, and threats to life and property, both on-site and off-site.                              |

# **Appendix G**

## **LSTA Units Not in Unit Pool**

# APPENDIX G

## LIST A: 1971-1972

(1971-1972)



## Appendix G

Units Not Considered for Analysis After Paper Plan Development or Initial Field Evaluations With Reason for Exclusion (P=Paper Plan, F=Field Review, AD=After DEIS).

|           |       |              |      |       |               | Unsuitable                   |                  |               |          |                                 |       |     |
|-----------|-------|--------------|------|-------|---------------|------------------------------|------------------|---------------|----------|---------------------------------|-------|-----|
| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Stream/Estuary/ Beach Buffer | V.High MMI Soils | Land Conveyed | Wetlands | Econ./Unmerch- antable/Low Vol. | Karst | HCA |
| 674-213   | 52    | AD           | 1    |       |               | 1                            |                  |               |          |                                 |       |     |
| 674-253   | 25    | AD           | 25   |       |               |                              | 25               |               |          |                                 |       |     |
| 674-265   | 53    | AD           | 28   |       |               |                              | 28               |               |          |                                 |       |     |
| 674-343   | 23    | F            | 23   |       |               |                              | 23               |               |          |                                 |       |     |
| 674-344   | 23    | F            | 23   |       |               |                              | 23               |               |          |                                 |       |     |
| 674-348   | 16    | F            | 16   |       |               |                              | 16               |               |          |                                 |       |     |
| TOTAL     | 192   | 0            | 116  | 0     | 0             | 1                            | 115              | 0             | 0        | 0                               | 0     | 0   |

|              |            |    |            |            |            |          |            |          |           |           |          |            |
|--------------|------------|----|------------|------------|------------|----------|------------|----------|-----------|-----------|----------|------------|
| 677-303      | 5          | F  | 5          |            |            |          | 5          |          |           |           |          |            |
| 677-304      | 80         | P  | 80         |            |            |          | 80         |          |           |           |          |            |
| 677-306      | 10         | P  | 10         |            |            |          | 10         |          |           |           |          |            |
| 677-307      | 15         | P  |            | 15         | 15         |          |            |          |           |           |          |            |
| 677-308      | 40         | P  |            | 40         | 40         |          |            |          |           |           |          |            |
| 677-310      | 15         | P  |            | 15         |            |          |            |          |           | 15        |          |            |
| 677-311      | 15         | AD | 15         |            |            |          |            |          |           |           |          | 15         |
| 677-312      | 30         | P  |            | 30         | 30         |          |            |          |           |           |          |            |
| 677-313      | 70         | P  |            | 70         | 70         |          |            |          |           |           |          |            |
| 677-314      | 25         | P  | 25         |            |            |          |            |          | 25        |           |          |            |
| 677-315      | 55         | AD | 55         |            |            |          |            |          |           |           |          | 55         |
| 677-316      | 60         | P  |            | 60         | 60         |          |            |          |           |           |          |            |
| 677-317      | 45         | P  |            | 45         |            |          |            |          |           | 45        |          |            |
| 677-318      | 25         | F  | 25         |            |            |          | 25         |          |           |           |          |            |
| 677-319      | 15         | AD | 15         |            |            |          |            |          |           |           |          | 15         |
| 677-320      | 10         | F  | 10         |            |            |          | 10         |          |           |           |          |            |
| 677-321      | 10         | P  |            | 10         |            |          |            |          |           | 10        |          |            |
| 677-322      | 10         | P  |            | 10         |            |          |            |          |           | 10        |          |            |
| 677-323      | 50         | P  |            | 50         | 50         |          |            |          |           |           |          |            |
| 677-326      | 30         | P  |            | 30         | 30         |          |            |          |           |           |          |            |
| 677-327      | 20         | AD | 20         |            |            |          |            |          |           |           |          | 20         |
| 677-328      | 14         | AD | 14         |            |            |          |            |          |           |           |          | 14         |
| <b>Total</b> | <b>649</b> |    | <b>274</b> | <b>375</b> | <b>295</b> | <b>0</b> | <b>130</b> | <b>0</b> | <b>25</b> | <b>80</b> | <b>0</b> | <b>119</b> |

|         |    |    |    |    |    |    |    |  |  |  |   |  |
|---------|----|----|----|----|----|----|----|--|--|--|---|--|
| 678-302 | 20 | P  |    | 20 | 20 |    |    |  |  |  |   |  |
| 678-303 | 23 | AD | 20 |    |    | 23 |    |  |  |  |   |  |
| 678-304 | 20 | P  |    | 20 | 20 |    |    |  |  |  |   |  |
| 678-305 | 6  | AD | 6  |    |    |    |    |  |  |  | 6 |  |
| 678-306 | 25 | P  |    | 25 | 25 |    |    |  |  |  |   |  |
| 678-307 | 20 | P  |    | 20 | 20 |    |    |  |  |  |   |  |
| 678-308 | 30 | P  |    | 30 | 30 |    |    |  |  |  |   |  |
| 678-309 | 25 | P  |    | 25 | 25 |    |    |  |  |  |   |  |
| 678-310 | 27 | AD | 6  |    |    | 1  |    |  |  |  | 5 |  |
| 678-311 | 40 | P  |    | 40 | 40 |    |    |  |  |  |   |  |
| 678-312 | 32 | AD | 2  |    |    | 2  |    |  |  |  |   |  |
| 678-313 | 15 | P  |    | 15 | 15 |    |    |  |  |  |   |  |
| 678-314 | 15 | AD | 15 |    |    |    | 15 |  |  |  |   |  |

## Appendix G

| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Unsuitable                      |                        |                  |          |                                    | Karst | HCA |
|-----------|-------|--------------|------|-------|---------------|---------------------------------|------------------------|------------------|----------|------------------------------------|-------|-----|
|           |       |              |      |       |               | Stream/Estuary/<br>Beach Buffer | V.High<br>MMI<br>Soils | Land<br>Conveyed | Wetlands | Econ./Unmerch-<br>antable/Low Vol. |       |     |
| 678-315   | 40    | P            |      | 40    | 40            |                                 |                        |                  |          |                                    |       |     |
| 678-316   | 17    | AD           | 17   |       |               |                                 | 17                     |                  |          |                                    |       |     |
| 678-317   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 678-318   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 678-319   | 35    | AD           | 26   |       |               |                                 | 26                     |                  |          |                                    |       |     |
| 678-320   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 678-321   | 30    | P            |      | 30    | 30            |                                 |                        |                  |          |                                    |       |     |
| 678-322   | 30    | P            | 30   |       |               |                                 | 30                     |                  |          |                                    |       |     |
| 678-323   | 10    |              |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 678-325   | 47    | AD           | 47   |       |               | 3                               | 44                     |                  |          |                                    |       |     |
| 678-326   | 40    | P            | 40   |       |               |                                 | 40                     |                  |          |                                    |       |     |
| 678-327   | 30    | P            | 30   |       |               |                                 | 30                     |                  |          |                                    |       |     |
| 678-329   | 10    |              |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 678-329   | 10    | P            | 10   |       |               |                                 | 10                     |                  |          |                                    |       |     |
| 678-330   | 20    | P            | 20   |       |               |                                 | 20                     |                  |          |                                    |       |     |
| 678-332   | 15    | P            | 15   |       |               |                                 | 15                     |                  |          |                                    |       |     |
| 678-333   | 30    | P            | 30   |       |               |                                 | 30                     |                  |          |                                    |       |     |
| 678-335   | 25    | P            | 25   |       |               |                                 | 25                     |                  |          |                                    |       |     |
| 678-336   | 40    | P/F          | 40   |       |               | 6                               |                        | 34               |          |                                    |       |     |
| 678-337   | 15    | P            | 15   |       |               |                                 | 15                     |                  |          |                                    |       |     |
| 678-338   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 678-340   | 65    | P            |      | 65    | 65            |                                 |                        |                  |          |                                    |       |     |
| 678-341   | 15    | P            | 15   |       |               |                                 | 15                     |                  |          |                                    |       |     |
| 678-342   | 15    | P            |      | 15    |               |                                 |                        |                  |          | 15                                 |       |     |
| 678-345   | 40    | P            | 40   |       |               |                                 | 40                     |                  |          |                                    |       |     |
| 678-348   | 15    | P            | 15   |       |               |                                 | 15                     |                  |          |                                    |       |     |
| 678-347   | 45    | P            | 45   |       |               | 15                              | 30                     |                  |          |                                    |       |     |
| 678-348   | 16    | AD           | 16   |       |               |                                 |                        |                  |          |                                    |       | 16  |
| 678-349   | 15    | P            | 15   |       |               | 15                              |                        |                  |          |                                    |       |     |
| 678-350   | 30    | P            |      | 30    | 30            |                                 |                        |                  |          |                                    |       |     |
| 678-351   | 40    | P            | 40   |       |               |                                 | 40                     |                  |          |                                    |       |     |
| 678-352   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 678-353   | 65    | P            |      | 65    | 65            |                                 |                        |                  |          |                                    |       |     |
| 678-354   | 5     | P            | 5    |       |               |                                 |                        | 5                |          |                                    |       |     |
| 678-355   | 70    | P            | 70   |       |               |                                 |                        | 70               |          |                                    |       |     |
| 678-356   | 60    | P            | 60   |       |               |                                 |                        | 60               |          |                                    |       |     |
| 678-357   | 55    | P            | 55   |       |               |                                 |                        | 55               |          |                                    |       |     |
| 678-358   | 70    | P            | 70   |       |               |                                 |                        | 70               |          |                                    |       |     |
| 678-359   | 40    | P            | 40   |       |               |                                 |                        | 40               |          |                                    |       |     |
| 678-360   | 30    | P            | 30   |       |               |                                 |                        | 30               |          |                                    |       |     |
| 678-361   | 30    | P            | 30   |       |               |                                 |                        | 30               |          |                                    |       |     |
| 678-362   | 30    | P            | 30   |       |               |                                 |                        | 30               |          |                                    |       |     |
| 678-363   | 25    | P            | 25   |       |               |                                 |                        | 25               |          |                                    |       |     |
| 678-364   | 50    | P            | 50   |       |               |                                 |                        | 50               |          |                                    |       |     |
| 678-365   | 55    | P            | 55   |       |               |                                 |                        | 55               |          |                                    |       |     |
| 678-366   | 60    | P            | 60   |       |               |                                 |                        | 60               |          |                                    |       |     |
| 678-367   | 45    | P            | 45   |       |               |                                 |                        | 45               |          |                                    |       |     |
| 678-368   | 70    | P            | 70   |       |               |                                 |                        | 70               |          |                                    |       |     |
| 678-369   | 40    | P            | 40   |       |               |                                 |                        | 40               |          |                                    |       |     |
| 678-370   | 40    | P            | 80   |       |               |                                 |                        | 80               |          |                                    |       |     |
| 678-371   | 90    | P            | 90   |       |               |                                 |                        | 90               |          |                                    |       |     |
| 678-372   | 105   | P            | 60   | 45    | 45            |                                 |                        | 60               |          |                                    |       |     |
| 678-373   | 85    | P            | 85   |       |               |                                 | 85                     |                  |          |                                    |       |     |



| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Stream/Estuary/ Beach Buffer | Unsuitable       |               |          |                                 |       |     |
|-----------|-------|--------------|------|-------|---------------|------------------------------|------------------|---------------|----------|---------------------------------|-------|-----|
|           |       |              |      |       |               |                              | V.High MMI Soils | Land Conveyed | Wetlands | Econ./Unmerch- antable/Low Vol. | Karst | HCA |
| 678-374   | 60    | P            |      | 60    | 60            |                              |                  |               |          |                                 |       |     |
| 678-376   | 75    | P            |      | 75    | 75            |                              |                  |               |          |                                 |       |     |
| 678-377   | 40    | P            |      | 40    | 40            |                              |                  |               |          |                                 |       |     |
| 678-378   | 25    | P            |      | 25    | 25            |                              |                  |               |          |                                 |       |     |
| 678-380   | 35    | P            |      | 35    | 35            |                              |                  |               |          |                                 |       |     |
| 678-382   | 35    | P            |      | 35    | 35            |                              |                  |               |          |                                 |       |     |
| 678-384   | 60    | P            |      | 60    | 60            |                              |                  |               |          |                                 |       |     |
| 678-386   | 60    | P            |      | 60    | 60            |                              |                  |               |          |                                 |       |     |
| 678-387   | 45    | P            |      | 45    | 45            |                              |                  |               |          |                                 |       |     |
| 678-388   | 60    | P            |      | 60    | 60            |                              |                  |               |          |                                 |       |     |
| 678-389   | 60    | P            | 60   |       |               |                              | 60               |               |          |                                 |       |     |
| 678-390   | 60    | P            |      | 60    | 60            |                              |                  |               |          |                                 |       |     |

|              |             |  |             |             |             |           |            |            |          |           |           |           |
|--------------|-------------|--|-------------|-------------|-------------|-----------|------------|------------|----------|-----------|-----------|-----------|
| <b>Total</b> | <b>2938</b> |  | <b>1690</b> | <b>1185</b> | <b>1170</b> | <b>65</b> | <b>602</b> | <b>999</b> | <b>0</b> | <b>15</b> | <b>11</b> | <b>16</b> |
|--------------|-------------|--|-------------|-------------|-------------|-----------|------------|------------|----------|-----------|-----------|-----------|

|         |    |    |    |    |    |  |    |    |  |  |  |    |
|---------|----|----|----|----|----|--|----|----|--|--|--|----|
| 679-301 | 25 | P  | 25 |    |    |  |    | 25 |  |  |  |    |
| 679-302 | 10 | P  |    | 10 | 10 |  |    |    |  |  |  |    |
| 679-303 | 15 | AD | 15 |    |    |  |    |    |  |  |  | 15 |
| 679-304 | 10 | P  | 10 |    |    |  | 10 |    |  |  |  |    |
| 679-305 | 50 | AD | 50 |    |    |  |    |    |  |  |  | 50 |
| 679-306 | 20 | P  |    | 20 | 20 |  |    |    |  |  |  |    |
| 679-307 | 25 | P  |    | 25 | 25 |  |    |    |  |  |  |    |
| 679-308 | 30 | P  |    | 30 | 30 |  |    |    |  |  |  |    |
| 679-309 | 60 | P  | 60 |    |    |  |    | 60 |  |  |  |    |
| 679-310 | 35 | P  | 35 |    |    |  |    | 35 |  |  |  |    |
| 679-311 | 60 | P  | 60 |    |    |  |    | 60 |  |  |  |    |
| 679-312 | 40 | P  | 40 |    |    |  |    | 40 |  |  |  |    |
| 679-313 | 40 | P  | 40 |    |    |  |    | 40 |  |  |  |    |
| 679-314 | 20 | P  | 20 |    |    |  |    | 20 |  |  |  |    |
| 679-315 | 35 | P  | 35 |    |    |  |    | 35 |  |  |  |    |
| 679-316 | 30 | P  | 30 |    |    |  |    | 30 |  |  |  |    |
| 679-317 | 65 | P  | 65 |    |    |  |    | 65 |  |  |  |    |
| 679-318 | 50 | AD | 50 |    |    |  |    |    |  |  |  | 50 |
| 679-319 | 25 | P  | 25 |    |    |  |    | 25 |  |  |  |    |
| 679-320 | 55 | AD | 55 |    |    |  |    |    |  |  |  | 55 |
| 679-321 | 40 |    | 40 |    |    |  |    |    |  |  |  | 40 |
| 679-322 | 25 | P  |    | 25 | 25 |  |    |    |  |  |  |    |
| 679-323 | 50 | AD | 50 |    |    |  |    |    |  |  |  | 50 |
| 679-324 | 35 | P  |    | 35 | 35 |  |    |    |  |  |  |    |
| 679-325 | 60 | AD | 60 |    |    |  |    |    |  |  |  | 60 |
| 679-326 | 30 | P  |    | 30 | 30 |  |    |    |  |  |  |    |
| 679-327 | 30 | P  |    | 30 | 30 |  |    |    |  |  |  |    |
| 679-328 | 45 | AD | 45 |    |    |  |    |    |  |  |  | 45 |
| 679-329 | 60 | P  |    | 60 | 60 |  |    |    |  |  |  |    |
| 679-330 | 40 | P  |    | 40 | 40 |  |    |    |  |  |  |    |
| 679-331 | 40 | AD | 80 |    |    |  |    |    |  |  |  | 80 |
| 679-332 | 25 | P  |    | 25 | 25 |  |    |    |  |  |  |    |
| 679-333 | 35 | P  |    | 35 | 35 |  |    |    |  |  |  |    |
| 679-334 | 10 | P  |    | 10 | 10 |  |    |    |  |  |  |    |
| 679-335 | 45 | P  |    | 15 | 15 |  |    |    |  |  |  |    |
| 679-336 | 70 | P  |    | 70 | 70 |  |    |    |  |  |  |    |
| 679-337 | 90 | AD | 90 |    |    |  |    |    |  |  |  | 90 |



## Appendix G

| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Unsuitable                      |                        |                  |          |                                    |       |     |
|-----------|-------|--------------|------|-------|---------------|---------------------------------|------------------------|------------------|----------|------------------------------------|-------|-----|
|           |       |              |      |       |               | Stream/Estuary/<br>Beach Buffer | V.High<br>MMI<br>Soils | Land<br>Conveyed | Wetlands | Econ./Unmerch-<br>antable/Low Vol. | Karst | HCA |
| 679-338   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 679-339   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 679-340   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 679-341   | 25    | AD           | 25   |       |               |                                 |                        |                  |          |                                    |       | 25  |
| 679-342   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 679-343   | 30    | P            |      | 30    | 30            |                                 |                        |                  |          |                                    |       |     |
| 679-344   | 45    | P            |      | 45    | 45            |                                 |                        |                  |          |                                    |       |     |
| 679-347   | 40    | P            |      | 40    | 40            |                                 |                        |                  |          |                                    |       |     |
| 679-348   | 30    | P            |      | 30    | 30            |                                 |                        |                  |          |                                    |       |     |
| 679-349   | 15    | P            |      | 15    | 15            |                                 |                        |                  |          |                                    |       |     |
| 679-350   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 679-351   | 40    | P            |      | 40    | 40            |                                 |                        |                  |          |                                    |       |     |
| 679-352   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-353   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-354   | 10    | P            | 10   |       |               |                                 |                        | 10               |          |                                    |       |     |
| 679-355   | 45    | AD           | 45   |       |               |                                 |                        |                  |          |                                    |       | 45  |
| 679-356   | 15    | F            | 15   |       |               | 15                              |                        |                  |          |                                    |       |     |
| 679-357   | 30    | P            |      | 30    | 30            |                                 |                        |                  |          |                                    |       |     |
| 679-358   | 15    | P            |      | 15    | 15            |                                 |                        |                  |          |                                    |       |     |
| 679-359   | 15    | P            |      | 15    | 15            |                                 |                        |                  |          |                                    |       |     |
| 679-360   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 679-362   | 40    | P            |      | 40    | 40            |                                 |                        |                  |          |                                    |       |     |
| 679-363   | 67    | AD           | 1    |       |               | 1                               |                        |                  |          |                                    |       |     |
| 679-364   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-365   | 60    | P            |      | 60    | 60            |                                 |                        |                  |          |                                    |       |     |
| 679-366   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-367   | 30    | AD           | 1    |       |               | 1                               |                        |                  |          |                                    |       |     |
| 679-368   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-369   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 679-370   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-371   | 15    | F            | 15   |       |               | 15                              |                        |                  |          |                                    |       |     |
| 679-372   | 15    | P            |      | 15    | 15            |                                 |                        |                  |          |                                    |       |     |
| 679-373   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-374   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-375   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-376   | 23    | AD           | 23   |       |               | 23                              |                        |                  |          |                                    |       |     |
| 679-377   | 30    | P            |      | 30    | 30            |                                 |                        |                  |          |                                    |       |     |
| 679-378   | 30    | AD           | 1    |       |               | 1                               |                        |                  |          |                                    |       |     |
| 679-379   | 2     |              |      | 2     |               |                                 |                        |                  |          | 2                                  |       |     |
| 679-380   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-381   | 30    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 679-382   | 4     | AD           | 1    |       |               | 1                               |                        |                  |          |                                    |       |     |
| 679-385   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-387   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-388   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-389   | 40    | P            |      | 40    | 40            |                                 |                        |                  |          |                                    |       |     |
| 679-390   | 5     | F            |      | 5     |               |                                 |                        |                  |          | 5                                  |       |     |
| 679-391   | 15    | P            |      | 15    | 15            |                                 |                        |                  |          |                                    |       |     |
| 679-392   | 50    | AD           | 1    |       |               | 1                               |                        |                  |          |                                    |       |     |
| 679-393   | 50    | P            |      | 50    | 50            |                                 |                        |                  |          |                                    |       |     |
| 679-394   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 679-395   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 679-396   | 20    | P            | 20   |       |               |                                 | 20                     |                  |          |                                    |       |     |

## Appendix G

## Unsuitable

| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Stream/Estuary/ Beach Buffer | V.High MMI Soils | Land Conveyed | Wetlands | Econ./Unmerch- antable/Low Vol. | Karst | HCA |
|-----------|-------|--------------|------|-------|---------------|------------------------------|------------------|---------------|----------|---------------------------------|-------|-----|
| 679-397   | 35    | P            |      | 35    | 35            |                              |                  |               |          |                                 |       |     |
| 679-398   | 10    | P            | 10   |       |               |                              | 10               |               |          |                                 |       |     |
| 679-401   | 45    | P            |      | 45    | 45            |                              |                  |               |          |                                 |       |     |
| 679-402   | 15    | P            |      | 15    | 15            |                              |                  |               |          |                                 |       |     |
| 679-404   | 75    | P            |      | 75    | 75            |                              |                  |               |          |                                 |       |     |
| 679-405   | 5     | P            |      | 5     | 5             |                              |                  |               |          |                                 |       |     |
| 679-406   | 25    | P            |      | 25    | 25            |                              |                  |               |          |                                 |       |     |
| 679-407   | 43    | AD           | 43   |       |               |                              |                  |               |          |                                 | 43    |     |
| 679-408   | 20    | P            |      | 20    | 20            |                              |                  |               |          |                                 |       |     |
| 679-410   | 25    | P            |      | 25    | 25            |                              |                  |               |          |                                 |       |     |
| 679-412   | 15    | P            |      | 15    |               |                              |                  |               |          | 15                              |       |     |
| 679-415   | 50    | P            |      | 50    | 50            |                              |                  |               |          |                                 |       |     |
| 679-416   | 30    | P            |      | 30    | 30            |                              |                  |               |          |                                 |       |     |
| 679-417   | 20    | P            |      | 20    | 20            |                              |                  |               |          |                                 |       |     |
| 679-418   | 50    | P            |      | 50    | 50            |                              |                  |               |          |                                 |       |     |
| 679-419   | 15    | P            |      | 15    | 15            |                              |                  |               |          |                                 |       |     |
| 679-420   | 53    | AD           |      | 53    |               |                              |                  |               |          |                                 |       |     |
| 679-422   | 47    | AD           |      | 47    |               |                              |                  |               |          |                                 |       |     |
| 679-425   | 43    | AD           | 1    |       |               | 1                            |                  |               |          |                                 |       |     |
| 679-426   | 60    | P            |      | 60    | 60            |                              |                  |               |          |                                 |       |     |
| 679-427   | 50    | P            |      | 50    | 50            |                              |                  |               |          |                                 |       |     |
| 679-430   | 25    | P            |      | 25    | 25            |                              |                  |               |          |                                 |       |     |
| 679-431   | 10    | P            |      | 10    | 10            |                              |                  |               |          |                                 |       |     |
| 679-432   | 10    | P            |      | 10    | 10            |                              |                  |               |          |                                 |       |     |
| 679-434   | 45    | P            |      | 45    | 45            |                              |                  |               |          |                                 |       |     |
| 679-435   | 35    | P            |      | 35    | 35            |                              |                  |               |          |                                 |       |     |
| 679-436   | 40    | P            |      | 40    | 40            |                              |                  |               |          |                                 |       |     |
| 679-437   | 3     | AD           | 3    |       |               | 3                            |                  |               |          |                                 |       |     |
| 679-438   | 30    | P            |      | 30    | 30            |                              |                  |               |          |                                 |       |     |
| 679-439   | 30    | P            |      | 30    | 30            |                              |                  |               |          |                                 |       |     |
| 679-440   | 80    | P            |      | 80    | 80            |                              |                  |               |          |                                 |       |     |
| 679-442   | 60    | P            |      | 60    | 60            |                              |                  |               |          |                                 |       |     |
| 679-443   | 70    | P            |      | 70    | 70            |                              |                  |               |          |                                 |       |     |
| 679-444   | 70    | P            |      | 70    | 70            |                              |                  |               |          |                                 |       |     |
| 679-445   | 50    | P            |      | 50    | 50            |                              |                  |               |          |                                 |       |     |
| 679-446   | 24    | AD           | 24   |       |               | 24                           |                  |               |          |                                 |       |     |
| 679-448   | 50    | P            |      | 50    | 50            |                              |                  |               |          |                                 |       |     |
| 679-449   | 65    | P            |      | 65    | 65            |                              |                  |               |          |                                 |       |     |
| 679-452   | 40    | P            |      | 40    | 40            |                              |                  |               |          |                                 |       |     |
| 679-453   | 10    | P            | 10   |       |               |                              |                  | 10            |          |                                 |       |     |
| 679-454   | 10    | P            | 10   |       |               |                              |                  | 10            |          |                                 |       |     |
| 679-455   | 50    | P            | 50   |       |               |                              |                  | 50            |          |                                 |       |     |
| 679-456   | 60    | P            | 60   |       |               |                              |                  | 60            |          |                                 |       |     |
| 679-457   | 20    | P            | 20   |       |               |                              |                  | 20            |          |                                 |       |     |
| 679-458   | 5     | P            | 5    |       |               |                              |                  | 5             |          |                                 |       |     |
| 679-459   | 30    | P            |      | 30    |               |                              |                  |               |          | 30                              |       |     |
| 679-460   | 50    | P            | 50   |       |               |                              |                  | 50            |          |                                 |       |     |
| 679-461   | 35    | P            | 35   |       |               |                              |                  | 35            |          |                                 |       |     |
| 679-462   | 45    | P            | 45   |       |               |                              |                  | 45            |          |                                 |       |     |
| 679-463   | 30    | P            | 30   |       |               |                              |                  | 30            |          |                                 |       |     |
| 679-464   | 10    | P            | 10   |       |               |                              |                  | 10            |          |                                 |       |     |
| 679-465   | 50    | P            | 50   |       |               |                              |                  | 50            |          |                                 |       |     |
| 679-466   | 5     | P            | 5    |       |               |                              |                  | 5             |          |                                 |       |     |



## Appendix G

| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Unsuitable                      |                        |                  |          |                                    | Karst | HCA |
|-----------|-------|--------------|------|-------|---------------|---------------------------------|------------------------|------------------|----------|------------------------------------|-------|-----|
|           |       |              |      |       |               | Stream/Estuary/<br>Beach Buffer | V.High<br>MMI<br>Soils | Land<br>Conveyed | Wetlands | Econ./Unmerch-<br>antable/Low Vol. |       |     |
| 679-469   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 679-470   | 35    | AD           | 35   |       |               | 5                               | 25                     |                  |          | 5                                  |       |     |
| 679-471   | 25    | AD           | 25   |       |               |                                 | 20                     |                  |          | 5                                  |       |     |
| 679-472   | 40    | P            |      | 40    | 40            |                                 |                        |                  |          |                                    |       |     |
| 679-474   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-478   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-480   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-481   | 15    | P            |      | 15    | 15            |                                 |                        |                  |          |                                    |       |     |
| 679-492   | 55    | P            |      | 55    | 55            |                                 |                        |                  |          |                                    |       |     |
| 679-483   | 30    | AD           | 30   |       |               |                                 |                        |                  |          |                                    |       | 30  |
| 679-484   | 30    | P            |      | 30    | 30            |                                 |                        |                  |          |                                    |       |     |
| 679-485   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-486   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 679-487   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 679-489   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-490   | 15    | P            | 15   |       |               | 15                              |                        |                  |          |                                    |       |     |
| 679-491   | 5     | P            |      | 5     |               |                                 |                        |                  |          | 5                                  |       |     |
| 679-492   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 679-493   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 679-494   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-495   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-496   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-497   | 14    | AD           | 14   |       |               | 14                              |                        |                  |          |                                    |       |     |
| 679-498   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 679-499   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-500   | 5     | P            |      | 5     | 5             |                                 |                        |                  |          |                                    |       |     |
| 679-501   | 15    | AD           | 15   |       |               |                                 |                        |                  |          | 15                                 |       |     |
| 679-502   | 19    | AD           | 18   |       |               | 18                              |                        |                  |          |                                    |       |     |
| 679-503   | 19    | AD           | 18   |       |               |                                 |                        |                  |          |                                    |       | 19  |
| 679-504   | 7     | AD           | 7    |       |               |                                 |                        |                  |          |                                    |       | 7   |
| 679-505   | 17    | AD           | 17   |       |               |                                 |                        |                  |          |                                    |       | 17  |
| 679-508   | 9     | AD           | 9    |       |               | 9                               |                        |                  |          |                                    |       |     |
| Total     | 5242  | 0            | 1803 | 3212  | 3055          | 147                             | 85                     | 825              | 0        | 82                                 | 43    | 678 |

|         |    |    |    |    |    |    |  |  |  |    |  |  |  |  |
|---------|----|----|----|----|----|----|--|--|--|----|--|--|--|--|
| 680-301 | 10 | P  | 10 |    |    | 10 |  |  |  |    |  |  |  |  |
| 680-302 | 15 | P  | 15 |    |    | 15 |  |  |  |    |  |  |  |  |
| 680-303 | 15 | P  |    | 15 | 15 |    |  |  |  |    |  |  |  |  |
| 680-304 | 5  | P  |    | 5  | 5  |    |  |  |  |    |  |  |  |  |
| 680-305 | 25 | P  | 25 |    |    | 25 |  |  |  |    |  |  |  |  |
| 680-306 | 30 | F  | 30 |    |    | 30 |  |  |  |    |  |  |  |  |
| 680-307 | 15 | P  |    | 15 | 15 |    |  |  |  |    |  |  |  |  |
| 680-308 | 10 | P  |    | 10 | 10 |    |  |  |  |    |  |  |  |  |
| 680-309 | 15 | F  | 15 |    |    | 15 |  |  |  |    |  |  |  |  |
| 680-314 | 25 | P  |    | 25 | 25 |    |  |  |  |    |  |  |  |  |
| 680-312 | 5  | P  |    | 5  | 5  |    |  |  |  |    |  |  |  |  |
| 680-314 | 20 | F  |    | 20 |    |    |  |  |  | 20 |  |  |  |  |
| 680-315 | 15 | P  | 15 |    |    | 15 |  |  |  |    |  |  |  |  |
| 680-316 | 5  | F  |    |    |    | 5  |  |  |  |    |  |  |  |  |
| 680-317 | 30 | AD | 2  |    |    | 2  |  |  |  |    |  |  |  |  |



## Appendix G

| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Unsuitable                      |                        |                  |          |                                    |       |     |
|-----------|-------|--------------|------|-------|---------------|---------------------------------|------------------------|------------------|----------|------------------------------------|-------|-----|
|           |       |              |      |       |               | Stream/Estuary/<br>Beach Buffer | V.High<br>MMI<br>Soils | Land<br>Conveyed | Wetlands | Econ./Unmerch-<br>antable/Low Vol. | Karst | HCA |
| 680-318   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 680-319   | 10    | P            |      | 10    | 10            |                                 |                        |                  |          |                                    |       |     |
| 680-320   | 5     | P            |      | 5     |               |                                 |                        |                  |          | 5                                  |       |     |
| 680-321   | 50    | P            |      | 50    |               |                                 |                        |                  |          | 50                                 |       |     |
| 680-322   | 15    | P            |      | 15    |               |                                 |                        |                  |          | 15                                 |       |     |
| 680-323   | 35    | P            |      | 35    |               |                                 |                        |                  |          | 35                                 |       |     |
| 680-324   | 40    | P            |      | 40    | 40            |                                 |                        |                  |          |                                    |       |     |
| 680-325   | 30    | P            |      | 30    |               |                                 |                        |                  |          | 30                                 |       |     |
| 680-326   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 680-327   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 680-328   | 20    | P            |      | 20    |               |                                 |                        |                  |          | 20                                 |       |     |
| 680-329   | 35    | P            |      | 35    |               |                                 |                        |                  |          | 35                                 |       |     |
| 680-330   | 32    | AD           | 32   |       |               | 17                              | 10                     |                  |          | 5                                  |       |     |
| 680-331   | 20    | P            |      | 20    | 20            |                                 |                        |                  |          |                                    |       |     |
| 680-332   | 25    | P            |      | 25    | 25            |                                 |                        |                  |          |                                    |       |     |
| 680-333   | 2     |              | 2    |       |               | 2                               |                        |                  |          |                                    |       |     |
| 680-334   | 35    | P            |      | 35    | 35            |                                 |                        |                  |          |                                    |       |     |
| 680-335   | 40    | AD           | 40   |       |               | 7                               |                        |                  |          | 33                                 |       |     |
| 694       |       |              | 186  | 475   | 265           | 143                             | 10                     |                  |          | 248                                |       |     |

|         |    |    |    |    |    |  |    |  |  |    |  |    |
|---------|----|----|----|----|----|--|----|--|--|----|--|----|
| 681-301 | 5  | P  |    | 5  | 5  |  |    |  |  |    |  |    |
| 681-302 | 15 | P  |    | 15 | 15 |  |    |  |  |    |  |    |
| 681-303 | 25 | P  |    | 25 | 25 |  |    |  |  |    |  |    |
| 681-305 | 25 | P  |    | 25 | 25 |  |    |  |  |    |  |    |
| 681-307 | 20 | P  |    | 20 | 20 |  |    |  |  |    |  |    |
| 681-309 | 55 | P  |    | 55 | 55 |  |    |  |  |    |  |    |
| 681-310 | 25 | P  |    | 25 | 25 |  |    |  |  |    |  |    |
| 681-311 | 10 | P  |    |    |    |  |    |  |  | 10 |  |    |
| 681-312 | 20 | P  |    | 20 |    |  |    |  |  | 20 |  |    |
| 681-313 | 5  | P  |    | 5  |    |  |    |  |  | 5  |  |    |
| 681-314 | 20 | P  |    | 20 |    |  |    |  |  | 20 |  |    |
| 681-315 | 25 | P  |    | 25 | 25 |  |    |  |  |    |  |    |
| 681-316 | 10 | AD | 10 |    |    |  |    |  |  | 19 |  |    |
| 681-317 | 20 | P  |    | 20 | 20 |  |    |  |  |    |  |    |
| 681-318 | 10 | P  |    | 10 | 10 |  |    |  |  |    |  |    |
| 681-319 | 45 | F  | 15 |    |    |  | 15 |  |  |    |  |    |
| 681-320 | 10 | P  |    | 10 | 10 |  |    |  |  |    |  |    |
| 681-321 | 20 | P  |    | 20 |    |  |    |  |  | 20 |  |    |
| 681-324 | 55 | P  |    | 55 | 55 |  |    |  |  |    |  |    |
| 681-325 | 50 | P  | 50 |    |    |  | 50 |  |  |    |  |    |
| 681-326 | 30 | P  |    | 30 | 30 |  |    |  |  |    |  |    |
| 681-327 | 20 | P  |    | 20 | 20 |  |    |  |  |    |  |    |
| 681-328 | 40 | P  |    | 40 | 40 |  |    |  |  |    |  |    |
| 681-329 | 60 | P  |    | 60 | 60 |  |    |  |  |    |  |    |
| 681-330 | 50 | AD | 50 |    |    |  |    |  |  |    |  | 50 |
| 681-331 | 50 | P  |    | 50 | 50 |  |    |  |  |    |  |    |
| 681-333 | 30 | P  |    | 30 | 30 |  |    |  |  |    |  |    |
| 681-334 | 45 | P  |    | 45 | 45 |  |    |  |  |    |  |    |
| 681-335 | 30 | P  |    | 30 | 30 |  |    |  |  |    |  |    |



## Appendix G

|           |       |              |      |       |               | Unsuitable                      |                     |               |          |                                    |       |     |
|-----------|-------|--------------|------|-------|---------------|---------------------------------|---------------------|---------------|----------|------------------------------------|-------|-----|
| VCU Unit# | Acres | When Removed | Drop | Defer | Adjac. Requi. | Stream/Estuary/<br>Beach Buffer | V.High MMI<br>Soils | Land Conveyed | Wetlands | Econ./Unmerch-<br>antable/Low Vol. | Karst | HCA |
| 681-337   | 35    | AD           | 35   |       |               |                                 |                     |               |          |                                    |       | 35  |
| 681-338   | 50    | AD           | 50   |       |               |                                 |                     |               |          |                                    |       | 50  |
| 681-339   | 10    | P            |      | 10    | 10            |                                 |                     |               |          |                                    |       |     |
| 681-340   | 40    | P            |      | 40    | 40            |                                 |                     |               |          |                                    |       |     |
| 681-341   | 30    | P            |      | 30    | 30            |                                 |                     |               |          |                                    |       |     |
| 681-342   | 20    | P            |      | 20    | 20            |                                 |                     |               |          |                                    |       |     |
| 681-343   | 35    | P            |      | 35    | 35            |                                 |                     |               |          |                                    |       |     |
| 681-344   | 10    | P            |      | 10    |               |                                 |                     |               |          | 15                                 |       |     |
| 681-345   | 10    | P            |      | 10    |               |                                 |                     |               |          | 15                                 |       |     |
| 681-346   | 15    | P            |      | 15    | 15            |                                 |                     |               |          |                                    |       |     |
| 681-347   | 30    | AD           | 30   |       |               |                                 |                     |               |          |                                    |       | 30  |
| 681-348   | 35    | P            |      | 35    | 35            |                                 |                     |               |          |                                    |       |     |
| 681-350   | 25    | P            |      | 25    | 25            |                                 |                     |               |          |                                    |       |     |
| 681-351   | 30    | P            |      | 30    | 30            |                                 |                     |               |          |                                    |       |     |
| 681-352   | 35    | AD           | 35   |       |               |                                 |                     |               |          |                                    |       | 35  |
| 681-354   | 40    | P            |      | 40    | 40            |                                 |                     |               |          |                                    |       |     |
| 681-355   | 25    | P            |      | 25    | 25            |                                 |                     |               |          |                                    |       |     |
| 681-356   | 20    | P            |      | 20    |               |                                 |                     |               |          | 20                                 |       |     |
| 681-359   | 20    | P            | 20   |       |               | 20                              |                     |               |          |                                    |       |     |
| 681-359   | 10    | P            | 10   |       |               | 10                              |                     |               |          |                                    |       |     |
| 681-361   | 20    | AD           | 20   |       |               |                                 |                     |               |          |                                    |       | 20  |
| 681-362   | 20    | P            |      | 20    | 20            |                                 |                     |               |          |                                    |       |     |
| 681-363   | 10    | AD           | 10   |       |               | 10                              |                     |               |          |                                    |       |     |
| 681-365   | 7     | AD           | 7    |       |               | 7                               |                     |               |          |                                    |       |     |
| 681-366   | 20    | P            |      | 20    | 20            |                                 |                     |               |          |                                    |       |     |
| 681-367   | 30    | AD           | 20   |       |               | 20                              |                     |               |          |                                    |       |     |
| 681-368   | 10    | AD           | 10   |       |               | 1                               | 9                   |               |          |                                    |       |     |
| 681-371   | 25    | P            |      | 25    | 25            |                                 |                     |               |          |                                    |       |     |
| 681-372   | 2     | AD           | 2    |       |               | 2                               |                     |               |          |                                    |       |     |
| 681-373   | 25    | AD           | 25   |       |               |                                 |                     |               |          | 25                                 |       |     |
| 681-374   | 15    | P            |      | 15    | 15            |                                 |                     |               |          |                                    |       |     |
| 681-375   | 40    | P            |      | 40    | 40            |                                 |                     |               |          |                                    |       |     |
| 681-376   | 5     | AD           | 5    |       |               | 5                               |                     |               |          |                                    |       |     |
| 681-377   | 7     |              | 7    |       |               | 5                               |                     |               |          |                                    |       |     |
| 681-380   | 15    | P            |      | 15    |               |                                 |                     |               |          | 15                                 |       |     |
| 681-381   | 15    | P            |      | 15    | 15            |                                 |                     |               |          |                                    |       |     |
| 681-383   | 8     |              | 8    |       |               | 8                               |                     |               |          |                                    |       |     |
| TOTAL     | 1609  |              | 428  | 1155  | 1035          | 88                              | 74                  | 0             | 0        | 174                                | 0     | 220 |

|         |    |    |    |    |    |    |    |  |    |  |  |    |
|---------|----|----|----|----|----|----|----|--|----|--|--|----|
| 682-301 | 35 | AD |    | 35 | 35 |    |    |  |    |  |  |    |
| 682-302 | 37 | AD | 1  | 25 | 15 | 1  | 10 |  |    |  |  |    |
| 682-303 | 25 | AD |    | 25 |    | 5  |    |  | 20 |  |  |    |
| 682-305 | 20 | AD | 20 |    |    |    |    |  |    |  |  | 20 |
| 682-306 | 20 | AD | 14 |    |    | 10 |    |  |    |  |  |    |
| 682-307 | 10 | AD | 10 |    |    |    |    |  | 10 |  |  |    |
| 682-500 | 73 | AD | 73 |    |    |    |    |  |    |  |  | 73 |
| 682-501 | 34 | AD | 34 |    |    |    |    |  |    |  |  | 34 |
| 682-502 | 30 | AD | 30 |    |    |    |    |  |    |  |  | 30 |
| 682-503 | 19 | AD | 19 |    |    |    |    |  |    |  |  | 19 |

## Appendix G

## Unsuitable

| VCU Unit#     | Acres        | When Removed | Drop        | Defer       | Adjac. Requi. | Stream/Estuary/ Beach Buffer | V.High MMI Soils | Land Conveyed | Wetlands  | Econ./Unmerch- antable/Low Vol. | Karst     | HCA         |
|---------------|--------------|--------------|-------------|-------------|---------------|------------------------------|------------------|---------------|-----------|---------------------------------|-----------|-------------|
| <b>TOTAL</b>  | <b>309</b>   |              | <b>201</b>  | <b>85</b>   | <b>50</b>     | <b>20</b>                    | <b>10</b>        | <b>0</b>      | <b>30</b> | <b>0</b>                        | <b>0</b>  | <b>176</b>  |
| 674           | 192          | 0            | 116         | 0           | 0             | 1                            | 115              | 0             | 0         | 0                               | 0         | 0           |
| 677           | 649          | 0            | 274         | 375         | 295           | 0                            | 130              | 0             | 25        | 80                              | 0         | 119         |
| 678           | 2938         | 0            | 1690        | 1185        | 1170          | 65                           | 602              | 999           | 0         | 15                              | 11        | 16          |
| 679           | 5242         | 0            | 1803        | 3212        | 3055          | 147                          | 85               | 825           | 0         | 82                              | 43        | 678         |
| 680           | 694          | 0            | 186         | 475         | 265           | 143                          | 10               | 0             | 0         | 248                             | 0         | 0           |
| 681           | 1609         | 0            | 428         | 1155        | 1035          | 88                           | 74               | 0             | 0         | 174                             | 0         | 220         |
| 682           | 309          | 0            | 201         | 85          | 50            | 20                           | 10               | 0             | 30        | 0                               | 0         | 176         |
| <b>TOTALS</b> | <b>11633</b> | <b>0</b>     | <b>4698</b> | <b>6487</b> | <b>5870</b>   | <b>464</b>                   | <b>1026</b>      | <b>1824</b>   | <b>55</b> | <b>599</b>                      | <b>54</b> | <b>1209</b> |





# **Appendix H**

## **Silviculture Diagnosis and Sale Area Improvement Plan**

Apprenticeship

Shakespeare's Apprenticeship  
and the Arts  
in the Renaissance



CHASINA UNIT DIAGNOSIS---APPENDIX H

| VCU | Unit | Ac. | AC.@ VOL. PER ACRE (MBF) |    |    |    |    |    |    |    |      |       | TOT VOL | Log Syst | Reg Syst | % YC | Elv | Mist Leto | WT Risk | Prod Ave S.I. | Asp | Iso-lated                  | Proposed Mgmt |
|-----|------|-----|--------------------------|----|----|----|----|----|----|----|------|-------|---------|----------|----------|------|-----|-----------|---------|---------------|-----|----------------------------|---------------|
|     |      |     | 10                       | 15 | 20 | 25 | 30 | 35 | 40 | 50 |      |       |         |          |          |      |     |           |         |               |     |                            |               |
| 674 | 213  | 51  |                          |    |    |    | 20 | 31 |    |    | 1840 | SL/RS | CC/PC   |          | M        |      | H   | H         | 80      | NW            |     | RS, PCT15, CT              |               |
| 674 | 265  | 25  |                          |    |    |    | 25 |    |    |    | 750  | SL    | CC/PC   |          | M        |      | M   | M         | 80      | NW            |     | RS, PCT20, CT              |               |
| 677 | 301  | 10  |                          |    |    |    |    |    |    | 10 | 500  | HE    | CC      | 10       | M        |      |     | H         | 100     | NE            | Y   | RS                         |               |
| 677 | 302  | 3   |                          |    |    |    |    |    |    |    | 60   | HE    | CC      |          | H        |      | H   | L         | 55      | NE            | Y   | RS                         |               |
| 677 | 305  | 19  |                          | 11 |    |    |    |    | 8  |    | 485  | HE    | PC      | 15       | H        |      | H   | L         | 85      | SE            | Y   | RS                         |               |
| 677 | 311  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | CC      | 35       |          |      | L   | L         | 65      | SW            | Y   | RS, PLANT(YC), SS          |               |
| 677 | 315  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | CC      |          |          |      | L   | L         | 80      | NW            |     | RS, PCT25                  |               |
| 677 | 319  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | CC      | 5        | H        |      | L   | L         | 70      | NE            | Y   | RS                         |               |
| 677 | 327  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | CC      | 25       | H        |      | L   | M         | 80      | HE            | Y   | RS, PLANTYC, SS            |               |
| 677 | 328  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | CC      | 20       |          |      |     | L         | 80      | W             | Y   | RS, PLANTYC, SS,           |               |
| 678 | 301  | 14  |                          |    |    |    |    |    |    | 14 | 700  | RS    | CC      |          |          |      | L   | H         | 80      | N             |     | RS, PCT15, CT              |               |
| 678 | 303  | 18  |                          |    |    | 6  |    |    | 12 |    | 630  | RS    | CC      |          |          |      | L   | H         | 80      | N             |     | RS, PCT15, CT              |               |
| 678 | 305  | 0   |                          |    |    |    |    |    |    |    | 0    | RS    | CC      |          |          |      |     | H         | 40      | SE            |     | RS, PCT15, CT              |               |
| 678 | 310  | 26  |                          |    |    |    |    |    |    | 26 | 1276 | RS    | CC      |          | M        | H    | H   | H         | 80      |               |     | RS, REL, PCT15, CT         |               |
| 678 | 312  | 30  |                          |    |    |    | 30 |    |    |    | 840  | RS    | CC      |          |          |      | H   | M         | 80      | SE            |     | RS, PCT20, CT              |               |
| 678 | 314  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | PC      |          |          |      | L   | H         | 75      | E             |     | RS, PCT15, CT              |               |
| 678 | 316  | 33  |                          |    |    |    |    |    | 33 |    | 1320 | SL/H  | CC      |          | M        |      | M   | H         | 80      | NE            |     | RS, PCT15, CT              |               |
| 678 | 319  | 9   |                          |    |    | 9  |    |    |    |    | 225  | HE    | CC      | 20       | H        | M    |     | M         | 80      | N             |     | RS, PLANTYC, SS, PCT25     |               |
| 678 | 324  | 10  |                          |    |    | 10 |    |    |    |    | 250  | HE    | PC      |          | H        |      | H   | M         | 80      | N             | Y   | RS,                        |               |
| 678 | 325  | 17  |                          | 8  |    |    | 9  |    |    |    | 345  | HE    | OSR     |          | H        |      |     | M         | 65      | SE            | Y   | RS, PLANTYC, SS            |               |
| 678 | 331  | 5   |                          |    |    | 5  |    |    |    |    | 125  | HE    | CC      |          | H        | M    | H   | M         | 85      | NW            | Y   | RS                         |               |
| 678 | 334  | 17  |                          |    | 17 |    |    |    |    |    | 340  | HE    | CC      | 5        | H        | H    | H   | L         | 60      | W             | Y   | RS                         |               |
| 678 | 339  | 14  |                          |    |    |    |    |    |    | 14 | 560  | HE    | PC      |          |          |      | H   | H         | 60      | S             | Y   | RS                         |               |
| 678 | 343  | 24  |                          | 24 |    |    |    |    |    |    | 360  | HE    | CC      | 20       |          |      |     | L         | 65      | N             | Y   | RS, PLANTYC, SS            |               |
| 678 | 344  | 21  |                          |    |    |    | 21 |    |    |    | 525  | HE    | CC      |          | H        |      |     | M         | 85      | N             | Y   | RS                         |               |
| 678 | 348  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | CC      |          |          | M    |     | H         | 85      | W             |     | RS, PCT15, CT              |               |
| 678 | 375  | 36  |                          |    |    |    |    |    | 36 |    | 1440 | HE    | PC      |          | H        |      |     | H         | 85      | E             |     | RS                         |               |
| 678 | 379  | 16  |                          |    |    |    |    |    | 16 |    | 640  | HE    | PC      |          |          |      |     | H         | 85      | E             |     | RS                         |               |
| 678 | 381  | 48  |                          |    |    |    |    |    | 48 |    | 1920 | HE    | PC      |          |          |      |     | H         | 85      | E             |     | RS                         |               |
| 678 | 383  | 96  |                          |    |    | 96 |    |    |    |    | 2400 | HE    | PC      |          | H        |      |     | M         | 100     | SE            |     | RS                         |               |
| 678 | 385  | 50  |                          |    |    | 50 |    |    |    |    | 1250 | HE    | PC      |          | H        |      | L   | M         | 100     | SE            |     | RS                         |               |
| 679 | 303  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | PC      |          | H        |      |     | L         | 70      | SE            | Y   | RS, PLANTYC, SS            |               |
| 679 | 305  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | PC      |          | H        |      | H   | L         | 70      | SE            | Y   | RS                         |               |
| 679 | 318  | 0   |                          |    |    |    |    |    |    |    | 0    | RS    | PC      | 40       |          |      | H   | M         | 70      | S             |     | RS, PLANTYC, SS            |               |
| 679 | 320  | 0   |                          |    |    |    |    |    |    |    | 0    | SL    | PC      | 40       | H        |      | H   | M         | 70      | SE            | Y   | RS, PLANTYC, SS, PCT15, CT |               |
| 679 | 321  | 0   |                          |    |    |    |    |    |    |    | 0    | SL    | CC      | 25       | H        |      | H   | M         | 80      | E             |     | RS, PLANTYC, SS, PCT20, CT |               |
| 679 | 323  | 0   |                          |    |    |    |    |    |    |    | 0    | SL    | CC      | 10       | H        |      |     | M         | 75      | S             |     | RS, PCT20                  |               |
| 679 | 325  | 0   |                          |    |    |    |    |    |    |    | 0    | SL    | CC      | 50       | M        |      |     | M         | 70      | NE            |     | RS, PCT20, CT              |               |
| 679 | 328  | 0   |                          |    |    |    |    |    |    |    | 0    | SL    | CC      |          |          |      | H   | H         | 85      | E             |     | RS, PCT20                  |               |
| 679 | 331  | 0   |                          |    |    |    |    |    |    |    | 0    | SL    | CC      |          | H        |      |     | M         | 70      | S             |     | RS, PCT15, CT              |               |
| 679 | 337  | 0   |                          |    |    |    |    |    |    |    | 0    | HE    | PC      | 25       | H        |      |     | M         | 75      | NE            |     | RS, PLANTYC, SS            |               |
| 679 | 341  | 0   |                          |    |    |    |    |    |    |    | 0    | RS    | CC      |          |          |      |     | M         | 80      | W             |     | RS, PCT15, CT              |               |
| 679 | 355  | 0   |                          |    |    |    |    |    |    |    | 0    | SL    | CC      |          | M        |      |     | H         | 100     | NW            |     | RS, PCT15, CT              |               |

## CHASINA UNIT DIAGNOSIS---APPENDIX H

| VCU | Unit | Ac. | AC. @ VOL. PER ACRE (MBF) |    |    |    |    |    |    |      | TOT. VOL. | Log Syst | Reg. Syst | %YC | Elv | Mist. Leto | WT Risk | Prod S.I. | Ave | Asp | Iso-lated | Proposed Mgmt.                 |
|-----|------|-----|---------------------------|----|----|----|----|----|----|------|-----------|----------|-----------|-----|-----|------------|---------|-----------|-----|-----|-----------|--------------------------------|
|     |      |     | 10                        | 15 | 20 | 25 | 30 | 40 | 50 |      |           |          |           |     |     |            |         |           |     |     |           |                                |
| 679 | 361  | 31  |                           | 15 | 16 |    |    |    |    | 545  | RS        | CC       | 50        | H   | H   |            | L       | 40        | NW  |     |           | RS, PLTYC, SS, REL, PCT25+, CT |
| 679 | 363  | 66  |                           |    |    | 66 |    |    |    | 1650 | LS/HE     | CC/PC    |           |     |     | L          | M       | 80        | W   |     |           | RS, PCT20, CT                  |
| 679 | 367  | 39  |                           |    |    | 39 |    |    |    | 975  | RS/SL     | PC       |           |     |     | L          | M       | 70        | NW  |     |           | RS, REL, PCT25+                |
| 679 | 376  | 0   |                           |    |    |    |    |    |    | 0    | RS        | CC       | 35        |     |     | L          | L       | 70        | W   |     |           | RS, PCT20, CT                  |
| 679 | 378  | 29  |                           |    | 14 | 15 |    |    |    | 655  | LS        | CC       |           |     |     | M          | L       | 80        | W   |     |           | RS, PLTYC, SS, PCT25+          |
| 679 | 379  | 4   |                           |    |    | 4  |    |    |    | 100  | HE        | PC       |           |     |     |            | M       | 70        | W   |     |           | RS, PCT25+                     |
| 679 | 382  | 42  |                           | 42 |    |    |    |    |    | 630  | RS        | CC       |           |     |     | H          | L       | 100       | SW  |     |           | RS, PLTYC, SS, PCT20           |
| 679 | 383  | 7   |                           | 7  |    |    |    |    |    | 105  | RS        | CC       |           |     |     | H          | L       | 70        | E   |     |           | RS, PCT25+, CT                 |
| 679 | 384  | 14  |                           | 14 |    |    |    |    |    | 210  | RS/HE     | CC       |           |     |     | L          | L       | 40        | NE  |     |           | RS, PCT25+, CT                 |
| 679 | 386  | 19  |                           | 10 |    | 9  |    |    |    | 375  | RS        | CC       | 40        |     |     |            | M       | 70        | E   |     |           | RS, PLTYC, SS, PCT25+          |
| 679 | 392  | 49  |                           |    |    |    |    |    | 49 | 2450 | RS        | CC       |           |     |     | M          | H       | 100       | E   |     |           | RS, PCT20, CT                  |
| 679 | 403  | 71  |                           |    |    |    |    |    | 71 | 3550 | RS        | CC       |           |     |     |            | H       | 100       | SW  |     |           | RS, PCT15, CT                  |
| 679 | 407  | 0   |                           |    |    |    |    |    |    | 0    | RS        | CC       |           |     |     |            | H       | 100       | SW  |     |           | RS, PLTYC, SS, PCT25+, CT      |
| 679 | 409  | 80  |                           |    |    | 40 |    |    | 40 | 2600 | RS        | CC       |           |     | H   | H          | M       | 100       | SW  |     |           | RS, PLTSS, REL, PCT15, CT      |
| 679 | 413  | 13  |                           | 13 |    |    |    |    |    | 195  | HE        | CC       |           |     |     | L          | L       | 40        | NW  | Y   |           | RS, PLTYC, PCT25+              |
| 679 | 414  | 37  |                           | 37 |    |    |    |    |    | 555  | RS        | CC       | 40        |     |     | L          | L       | 65        | N   |     |           | RS, PLTYC, SS, PCT25+          |
| 679 | 420  | 53  |                           |    |    |    |    |    | 53 | 2650 | SL        | CC       |           |     |     | H          | H       | 100       | N   |     |           | RS, PCT15, CT                  |
| 679 | 422  | 46  |                           |    |    |    |    |    | 46 | 1840 | RS        | CC       | 50        |     |     |            | H       | 100       | N   |     |           | RS, PCT20, CT                  |
| 679 | 425  | 42  |                           |    |    |    | 42 |    |    | 1260 | HE        | ATC      |           |     |     | H          | L       | 80        | NW  |     |           | HE, CT-35                      |
| 679 | 433  | 62  |                           |    |    |    |    |    | 62 | 2480 | HE        | ATC      |           |     |     |            | H       | 100       | N   |     |           | RS75% PCT20, NO CT             |
| 679 | 437E | 65  |                           |    |    | 65 |    |    |    | 1535 | HE        | ATC      |           |     |     |            | M       | 80        | S   |     |           | HE49AC, RS16AC, PCT20, NO CT   |
| 679 | 437W | 47  |                           |    |    | 47 |    |    |    | 1110 | HE        | ATC      |           |     |     |            | M       | 80        | S   |     |           | RS ALL, PCT25, NO CT           |
| 679 | 441  | 46  |                           |    |    | 46 |    |    |    | 1150 | HE        | ATC      |           |     |     |            | M       | 100       | SW  |     |           | RS 12AC, PCT20, CT-35          |
| 679 | 446  | 6   |                           |    |    |    |    | 6  |    | 240  | HE        | CC       |           |     |     |            | H       | 100       | N   |     |           | RS, PCT20                      |
| 679 | 447  | 79  |                           |    |    |    |    | 79 |    | 3160 | HE        | ATC      |           |     |     |            | H       | 85        | NE  |     |           | RS, PCT20, NO CT               |
| 679 | 450  | 64  |                           |    |    | 19 |    | 45 |    | 2275 | HE        | ATC      |           |     |     |            | H       | 85        | NE  |     |           |                                |
| 679 | 451  | 0   |                           |    |    |    |    |    |    | 0    | HE        | CC       |           |     |     |            | H       | 80        | N   |     |           | RS, PCT25+                     |
| 679 | 467  | 54  |                           |    |    |    |    | 54 |    | 2160 | HE        | ATC      |           |     |     |            | H       | 85        | NW  |     |           | RSALL, PCT20, NO CT            |
| 679 | 470  | 15  |                           |    |    | 15 |    |    |    | 375  | SL        | CC       |           |     |     |            | M       | 100       | W   |     |           | RS, PCT15                      |
| 679 | 471  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     |            | L       | 65        | W   | Y   |           | RS                             |
| 679 | 473  | 31  |                           |    |    | 31 |    |    |    | 775  | HE        | CC       |           |     |     |            | M       | 65        | W   | Y   |           | RS                             |
| 679 | 475  | 68  |                           | 14 |    | 54 |    |    |    | 1560 | HE        | PC       |           |     |     | H          | L       | 65        | N   |     |           | RS, HE                         |
| 679 | 477  | 35  |                           |    |    |    |    | 35 |    | 1400 | HE/SL     | ATC      |           |     |     |            | H       | 100       | E   |     |           | NO CUT CONTROL                 |
| 679 | 479  | 18  |                           |    |    |    |    | 18 |    | 720  | HE        | CC       | ?         | H   | H   |            | H       | 100       | N   |     |           | RS, PLTYC, SS, SS, REL, PCT25+ |
| 679 | 483  | 0   |                           |    |    |    |    |    |    | 0    | RS        | PC       |           |     |     | L          | M       | 80        | W   |     |           | RS, PCT15                      |
| 679 | 497  | 21  |                           |    |    |    | 11 | 10 |    | 730  | RS/SL     | CC       |           |     |     |            | H       | 100       | W   |     |           | RS, PCT15                      |
| 679 | 501  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     |            | L       | 70        | W   |     |           | RS, PLTYC, SS, REL, PCT25+, CT |
| 679 | 502  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     |            | L       | 85        | S   |     |           | RS, PCT25+                     |
| 679 | 503  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     | H          | L       | 70        | S   |     |           | RS                             |
| 679 | 504  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     |            | L       | 70        | W   |     |           | RS                             |
| 679 | 505  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     | L          | L       | 70        | S   |     |           | RS                             |
| 679 | 506  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     | H          | M       | 70        | W   |     |           | RS                             |
| 679 | 507  | 0   |                           |    |    |    |    |    |    | 0    | HE        | PC       |           |     |     | L          | L       | 65        | E   |     |           | RS                             |



CHASINA UNIT DIAGNOSIS---APPENDIX H

| VCU   | Unit | Ac. | AC @ VOL. PER ACRE (MBF) |    |     |     |     |     |     |      |       |    | TOT. VOL. | Log |  | Reg. | % | Elv | Mist. | WT | Prod | Ave | Asp | iso-lated                  | Proposed |
|-------|------|-----|--------------------------|----|-----|-----|-----|-----|-----|------|-------|----|-----------|-----|--|------|---|-----|-------|----|------|-----|-----|----------------------------|----------|
|       |      |     | 10                       | 15 | 20  | 25  | 30  | 40  | 50  | Syst | Syst  | YC |           |     |  |      |   |     |       |    |      |     |     |                            |          |
| 679   | 508  | 0   |                          |    |     |     |     |     |     | 0    | HE    | PC |           |     |  |      |   |     |       | H  | 70   | E   |     | RS                         |          |
| 680   | 310  | 27  | 21                       |    |     | 6   |     |     |     | 360  | RS/HE | CC | 45        |     |  |      |   |     |       | L  | 70   | NE  |     | RS, PLTYC, SS, PCT25+      |          |
| 680   | 317  | 28  | 13                       |    |     | 15  |     |     |     | 505  | RS    | CC | ?         |     |  |      |   |     |       | M  | 80   | S   |     | RS, PCT25+                 |          |
| 680   | 330  | 28  |                          | 28 |     |     |     |     |     | 420  | RS    | CC | 45        |     |  | M    |   |     |       | L  | 60   | E   |     | RS, PLTYC, SS, REL, PCT25+ |          |
| 680   | 333  | 52  |                          |    |     | 52  |     |     |     | 1300 | SL    | CC |           |     |  |      |   |     |       | M  | 65   | NE  |     | RS, HE, REL, PCT20         |          |
| 680   | 335  | 0   |                          |    |     |     |     |     |     | 0    | RS    | PC | 40        |     |  |      |   |     |       | L  | 60   | E   |     | RS, PLTYC, SS, REL, PCT25+ |          |
| 681   | 304  | 52  | 22                       | 22 | 8   |     |     |     |     | 710  | RS/SL | CC | 60        |     |  |      |   |     |       | L  | 65   | SE  |     | RS, PCT25+                 |          |
| 681   | 308  | 3   | 3                        |    |     |     |     |     |     | 30   | RS    | CC | 60        |     |  |      |   |     |       | L  | 60   | SE  |     | RS, PCT25+                 |          |
| 681   | 316  | 36  |                          |    | 36  |     |     |     |     | 720  | SL/HE | CC | 15        |     |  |      |   |     |       | H  | 65   | NE  | Y   | RS, PCT25+                 |          |
| 681   | 322  | 47  |                          |    |     |     | 47  |     |     | 1410 | RS/HE | CC | 5         |     |  |      |   |     |       | M  | 60   | SE  | Y   | RS                         |          |
| 681   | 323  | 21  |                          | 21 |     |     |     |     |     | 315  | RS/HE | CC |           |     |  |      |   |     |       | L  | 65   | S   | Y   | RS, PCT20                  |          |
| 681   | 330  | 0   |                          |    |     |     |     |     |     | 0    | RS    | CC |           |     |  |      |   |     |       | M  | 80   | SE  |     | RS, PCT20                  |          |
| 681   | 332  | 26  | 5                        |    |     | 14  |     | 7   |     | 680  | RS/HE | CC |           |     |  |      |   |     |       | H  | 100  | S   |     | RS                         |          |
| 681   | 337  | 0   |                          |    |     |     |     |     | 0   | 0    | RS    | CC |           |     |  |      |   |     |       | H  | 100  | N   |     | RS, PCT20                  |          |
| 681   | 338  | 0   |                          |    |     |     |     |     |     | 0    | SL    | CC | 15        |     |  |      |   |     |       | L  | 100  | NW  |     | RS, PCT15                  |          |
| 681   | 347  | 0   |                          |    |     |     |     |     |     | 0    | SL    | CC |           |     |  |      |   |     |       | L  | 100  | SE  |     | RS, PCT20                  |          |
| 681   | 352  | 0   |                          |    |     |     |     |     |     | 0    | RS    | CC |           |     |  |      |   |     |       | H  | 100  | S   |     | RS, PCT25+                 |          |
| 681   | 361  | 0   |                          |    |     |     |     |     |     | 0    | RS    | CC |           |     |  |      |   |     |       | H  | 80   | SW  |     | RS, PCT15                  |          |
| 681   | 363  | 31  |                          |    |     |     |     | 31  |     | 1240 | SL    | CC | 40        |     |  |      |   |     |       | H  | 100  | N   |     | RS, PCT25+                 |          |
| 681   | 365  | 7   |                          |    |     | 7   |     |     |     | 175  | SL/HE | CC |           |     |  |      |   |     |       | M  | 80   | N   |     | RS, PCT25+                 |          |
| 681   | 367  | 16  |                          | 16 |     |     |     |     |     | 240  | HE    | PC |           |     |  |      |   |     |       | L  | 60   | NW  |     | RS, PCT25+                 |          |
| 681   | 368  | 96  |                          |    |     | 49  | 47  |     |     | 2635 | HE/SL | CC |           |     |  |      |   |     |       | M  | 60   | NW  |     | RS                         |          |
| 681   | 372  | 23  |                          |    |     | 13  |     | 10  |     | 725  | RS    | CC | 20        |     |  |      |   |     |       | M  | 80   | N   |     | RS                         |          |
| 681   | 373  | 21  |                          |    |     | 21  |     |     |     | 630  | RS    | CC | 70        |     |  |      |   |     |       | M  | 85   | E   |     | RS                         |          |
| 681   | 376  | 19  |                          |    | 19  |     |     |     |     | 380  | RS    | CC | 30        |     |  |      |   |     |       | L  | 65   | NE  |     | RS                         |          |
| 681   | 377  | 0   |                          |    |     |     |     |     |     | 0    | RS    | CC | 40        |     |  |      |   |     |       | L  | 65   | NE  |     | RS, PLTYC, SS, REL         |          |
| 681   | 383  | 0   |                          |    |     |     |     |     |     | 0    | HE    | PC |           |     |  |      |   |     |       | H  | 85   | N   |     | RS                         |          |
| 682   | 301  | 54  |                          |    |     |     | 25  | 29  |     | 1910 | SL    | CC | 15        |     |  |      |   |     |       | H  | 70   | SW  |     | RS, PCT20                  |          |
| 682   | 302  | 36  |                          |    |     | 20  | 16  |     |     | 980  | LS    | CC | 15        |     |  |      |   |     |       | M  | 80   | N   |     | RS                         |          |
| 682   | 303  | 0   |                          |    |     |     |     |     |     | 0    | LS    | CC | 50        |     |  |      |   |     |       | M  | 85   | S   |     | RS                         |          |
| 682   | 304  | 26  |                          |    |     | 26  |     |     |     | 650  | RS    | CC |           |     |  |      |   |     |       | M  | 85   | S   |     | RS, PLTYC, SS              |          |
| 682   | 305  | 0   |                          |    |     |     |     |     |     | 0    | SL    | CC | 50        |     |  |      |   |     |       | L  | 65   | SE  |     | RS, PLTYC, SS              |          |
| 682   | 306  | 26  |                          | 19 |     | 7   |     |     |     | 460  | SL    | CC | 60        |     |  |      |   |     |       | L  | 75   | SE  |     | RS                         |          |
| 682   | 500  | 0   |                          |    |     |     |     |     |     | 0    | SL    | CC |           |     |  |      |   |     |       | M  | 75   | HE  |     | RS, REL, PCT20             |          |
| 682   | 501  | 0   |                          |    |     |     |     |     |     | 0    | RS    | CC | 50        |     |  |      |   |     |       | M  | 100  | SW  |     | RS                         |          |
| 682   | 502  | 0   |                          |    |     |     |     |     |     | 0    | SL    | PC |           |     |  |      |   |     |       | M  | 100  | S   |     | RS, PCT20                  |          |
| 682   | 503  | 0   |                          |    |     |     |     |     |     | 0    | RS    | PC |           |     |  |      |   |     |       | L  | 75   | S   |     | RS, PCT25+                 |          |
| TOTAL |      |     | 2520                     | 64 | 301 | 113 | 865 | 284 | 670 | 223  |       |    |           |     |  |      |   |     |       |    |      |     |     |                            |          |





## **Chasina Project Area Sale Area Improvement Plan**

### **Natural Regeneration Surveys and Certification**

#### **Objective:**

Monitor the occurrence of natural regeneration stocking following harvest. Area direction in FSH 2409.17 calls for stocking levels of 300 trees/ac. with 60% stocked plots after the fifth growing season after final harvest. These surveys will be conducted on harvest units, units are expected to be harvested between 1999 and 2005. The stand will be certified as regenerated if 300 conifer seedlings per acre area established on 60% of a harvest unit. Work will also include data input into SIS, updating GIS, and SAI plan and prescription modifications to reflect stand changes. This work is required NFMA.

#### **Treatment:**

Surveys will be conducted three (3) growing seasons following harvest to assure that satisfactory levels of natural stocking has been achieved. Assumes 2002 as the midterm of the harvest areas, surveys would be conducted after the 2004 growing season.

### **Cone Collection**

#### **Objective/Justification:**

To collect an adequate amount of seed from the appropriate seed zones to accomplish required artificial regeneration. Seed will be collected from phenotypically superior trees which exhibit desirable characteristics in form, height, branch angle, resistance to insects and disease, etc. Planting of 90 acres of Alaska yellowcedar will require (90 acres X 200 TPA) 18,000 seedlings. Approximately 40,000 seedlings can be produced per pound of clean seed. Therefore .45 pounds of clean seed or 2.25 bushels (5 bushels/ pound seed) of cones must be collected. This should be rounded to 3 bushels assuming poor cone years. Cone collection will occur in moderate or good cone collecting years based on field surveys. Collections will be done by force account crews in the fall after the cones have matured. Collection will involve identifying phenotypically superior trees, felling the tree, picking, cleaning, and bagging the cones, tagging the bags, and transporting the cones to Petersburg where the seed will be stored until needed.

### **Artificial Reforestation**

#### **Objective/Justification:**

Alaska yellowcedar will be interplanted on approximately 90 acres to maintain species diversity within the stands. Natural Alaska yellowcedar restocking is unlikely because of: limiting distance of seed dispersal (300-400 feet); infrequent cone crops and low germination rates; lack of advance regeneration under the oldgrowth canopy due to shade intolerance; competition from other coniferous seedlings and heavy slash accumulations due to low volume stands. Planting will occur mainly on high elevation low-quality sites where yellowcedar occupies a portion of the site. Alaska yellowcedar 1-0 seedlings grown from local seed will be used. Planting is planned to occur in 2002, and will include updating SIS/GIS and SAI Plan and prescriptions modifications to reflect stand changes.

### **Plantation 1st Year Survival Exam**

#### **Objective/Justification:**

The 90 acres anticipated for planting on this project area will be examined after the first growing season after planting. The exam will determine seedling survival, growth, and the need for replanting and reforestation certification. Stake rows will be established to measure the survival. The costs also include data input into SIS, updating GIS, and SAI plans and prescription modifications to reflect stand change. This work is required by NFMA.

### **Plantation 3rd Year Survival Exam and Certification**

#### **Objective/Justification:**

The 90 acres surveyed from the 1st year survival exam will be exam in the 3rd growing season after planting. Using the same stake rows from the 1st year exam and certification if unit is full stocked.

### **Timber Harvest Evaluation**

#### **Objective/Justification:**

Harvest evaluations are desired to assess implementation success of prescriptions and effects on regeneration when using alternative harvest methods. The use of harvest techniques which incorporate selection harvest methods, retention of overstory structure, leave islands and leave strips has been limited in Southeast Alaska to date. The degree of success in implementing such prescriptions should be evaluated in order to determine how effective these prescriptions are in meeting multiple goals and objectives. If implemented properly and found to be successful in meeting goals and objectives, such prescriptions could be applied on a much broader basis to meet goals and objectives for ecosystem management.

#### **Treatment:**

Harvest evaluation will be performed by a certified silviculturist or those specifically training for the task under the direction of a certified silviculturist. Treatments which incorporate selection harvest methods, residual tree retention, leave areas,



leave islands, or other non-clearcut treatments will be evaluated as soon after harvest as practical, within two years of harvest completion. Evaluations will consist of a walkthrough or quick plot stand examination of treatment area during which measurements will be taken which will provide a basis for comparisons between expected and actual treatment results. If the prescriptions called for leaving 42 merchantable trees per acre, measurements would be taken for comparison with what was prescribed and anticipated. The prescription will be used as a baseline for comparison with actual on the ground results. Emphasis should be placed on evaluating why merchantable trees, intended for retention, were damaged or lost. A harvest evaluation report will be produced which compares prescriptive treatments and expected results with implemented treatment and actual results. Recommendations for adjusting future prescriptions, where appropriate, will be included in such reports.

### **Erosion Control**

#### **Objective/Justification:**

To stabilize and rehabilitate harvest activity initiated landslides within units and along roads which are no longer the responsibility of the purchaser to treat. Approximately one debris slide, 5 acres or larger, occurs for every 2,240 harvest acres Tongass wide (FEIS Tongass Land Management Plan, January 1997).

If slides occurring for every 2,240 harvested acres would increase one and one half fold. Average size of slides on the Ketchikan Area are acres (Loggy, 1974). The majority of these slides normally occur within 5 to 10 years after cutting or roading from the following combined impact: oversteepened slopes; storms with high winds and/or intensive rainfall; and where severed roots lose their holding capacity in 3 to 5 years after harvest. Approximately 3014 acres (1710 planned and 1304 of recent past) are planned for harvesting on this area. 3014 acres divided by 2,240 acres, times 1.5 slides per 2,240 acres, equals approximately 2 slides. Two slides times 5 acres equals approximately 10 acres which will need stabilization. Slides will be rehabilitated with introduced grasses and/or herbaceous vegetation. The treatment will stabilize surface soil erosion to prevent or reduce further sediment introduction into streams and/or loss in soil productivity.

### **Erosion Control Monitoring**

#### **Objective/Justification:**

To monitor the treatments planned above in Erosion Control. Followup monitoring is planned for two (2) years after initial rehabilitation to insure stabilization has been accomplished.

### **Precommercial Thinning**

#### **Objective:**

1) The objective of precommercial thinning is: 1) Increase timber yields by delaying the occurrence of competition for growing space between fast growing young trees. The site's wood growing potential is distributed over a few trees instead of many. This results in larger diameter stems over a shorter time span. 2) Increase the stand's spruce composition and ultimate yield and value through favoring spruce as future crop trees. 3) Remove the deformed, diseased trees. 4) And, prolong the understory vegetation for wildlife use by delaying crown closure.

Second-growth stands in southeast Alaska suffer from excessive competition for light because of large number of young trees that invade a clearcut. Because hemlock and spruce are shade tolerant the young stands have low mortality rates and trees do not express strong dominance in the first half of a rotation. Significant natural thinning through competition occurs late in the stand's life. Precommercial thinning will result in larger diameter trees over shorter time periods, increase sawlog yields about 10-12 %, and reduce rotation length by 10 to 20 years. Thinning may occur on approximately 2500 acres of planned second-growth and recently harvested acres.

#### **Treatment:**

Precommercial thinning will occur in stands of 15 to 25 years of age. Crop tree spacing will generally be 12'X12' but can vary according to the silviculture prescription.

### **Riparian Thinning**

#### **Objective:**

1) To decrease the time needed for large trees to be produced and contribute to the stream system. Large wood in streams stabilizes bedload, creates deep pools that fish need, serves as substrate for aquatic insect production, improves water quality by stabilizing stream banks, and dampens high flow events. Large wood increase the diversity in a stream system resulting in improved fish habitat. 2) Increase the value of the riparian zone for wildlife by providing more forage.

Riparian Management Areas (RMA) are areas of special concern to fish, other aquatic resources and wildlife. These areas are normally one tree height potential (100 to 140 feet) on either side of class I and II streams. Before TTRA buffer requirements were implemented, timber harvest activities in these areas were not protected by the 100 foot TTRA buffer. To

meet the Stream Process group objectives of retaining the natural integrity of channel side slopes and large woody debris retention, thinning of second growth should be conducted.

The thinning of the second growth will remove some trees in a stand so that the remaining trees should grow faster due to reduced competition for nutrients, water, and sunlight. Thinning will change the characteristics of a stand for wildlife or other purposes. Riparian thinning should open the stand and produce trees that can become available to the stream as large woody debris in a shorter period of time.

#### Treatment :

Riparian thinning would occur within the riparian management zone of class I and II streams that were not protected by the 100 foot TTRA buffers during past harvest. Thinning would generally be within 100 feet of the stream channels but may extend out further. It could extend further where the floodplain includes off channel rearing areas or where the stream channel is likely to migrate in the future. The thinning prescription would be very site specific and would probably vary throughout the area. It could include treating only alders in some areas and only conifers in others. Methods could vary from cutting the tree down to girdling or otherwise injuring the tree to kill it. A mix of tree species could be left to promote diversity. Planting spruce seedlings may also occur in suitable sites where spruce regeneration has been hindered.

#### Needs/Costs:

Layout and implementation cost is \$440.00 per acre (based on thinning for silviculture costs). Approximately 50 acres would be thinned.

Monitoring would evaluate the response of the stream ecosystem to the thinning treatments and would be pulsed with the greatest effort occurring five years following implementation. Total cost for monitoring is estimated at \$10,000.

#### Stream Rehabilitation

The stream system immediately north of unit 680-330 (stream # 102-50-10100) was beach logged in 1957 and the riparian forest was removed from the stream. The stream is currently lacking woody debris and the riparian area consists primarily of alders. The woody debris removal decreased pool habitat in the stream and destabilized the streambanks. Currently there is no recruitment of large woody debris to the stream because there are no large trees remaining along the stream. The stream is currently catalogued for only pink salmon but field data indicates a good probability that coho could be present.

#### Objective/Justification:

Increase the rate of recovery of fish habitat in the stream.

#### Treatment:

- 1) Treat the riparian area using thinning techniques described previously under riparian thinning.
- 2) Add structure to the stream in the form of logs or boulders. This will slow bedload movement, retain spawning gravels, and aid pool formation.

#### Fish Access Enhancement

The uncatalogued stream flowing into Clarence Strait south of Chasina Point through Sections 34, 35, & 26 contains a narrow chute/falls near saltwater that is apparently a barrier to coho and steelhead. It doesn't look like it would be too difficult to provide passage there by blasting in the chute. The system contains cutthroat or steelhead and dolly varden. The main rearing habitat is near the top of the watershed in a lake but spawning habitat at the lake appears limited. The system may not have a real high anadromous production potential. A cost benefit analysis for the project may not be positive. A coho run could be established by taking eggs from a nearby stream and using incubation boxes in the FP3 stream reach near the middle of the system. A stream survey with fish density estimates is available for the FP3 reach. There are approximately 1 3/4 miles of stream up to the lake.

Additional field work would be needed to determine project feasibility and need.

#### Objective/Justification:

Establish a coho run in a currently non-anadromous system.

#### Treatment:

- 1) Modify the chute near saltwater to provide easier fish access.
- 2) Conduct coho egg takes for 3 - 4 years in a nearby stream and plant the eggs in incubation boxes in this stream.



### **Wildlife Seeding of Specified Roads**

#### **Objective/Justification:**

This project is consistent with Regional and Forest direction to maintain wildlife habitat capability. The objective is to provide forage in and adjacent to harvest units to Sitka black-tailed deer and black bear. Seeding should occur in the initial years after timber harvest before there is much vegetation growth in the harvest units, or inhibiting alder growth.

#### **Treatment:**

The log purchaser is responsible for seeding all temporary roads and landings used during the sale. Therefore, treatment will include seeding of specified road #2160 behind the pulled bridge closure past Horseshoe Canyon (#2160787), this is approximately 5 miles. Road #2160607, past the blown culvert, will be closed and seeded, this is about 2 miles. Also, the Chasina Point (#2160000), approximately 4 miles will be seeded. Approximately 2 miles of road #2160850 in east Dolimi will be closed and seeded as well. Seeding will be a mixture of native seed, if possible. Fertilizer and urea will also be applied at the same time as the seed. Application will be done during the timing window to allow adequate growth.

### **Wildlife Thinning**

#### **Objectives/Justification:**

Variable spaced thinning would be used to open up the canopy to encourage growth of the understory vegetation while leaving dominant trees, creating tickets, mimicing and promoting the natural succession from a young-growth condition to a more diverse structure. The work would be contracted. Location could be in timber or non-timber emphasis land-use designations. Force account crews would be used for layout of the units, contract administration and monitoring. Monitoring will consist of four vegetative transects per 100 acres (2 people, 1 day).





# **Appendix I**

## **Deer Availability/ Deer Demand Maps**

# Appendix 1

Dear Applicant,  
Dear Customer Representative

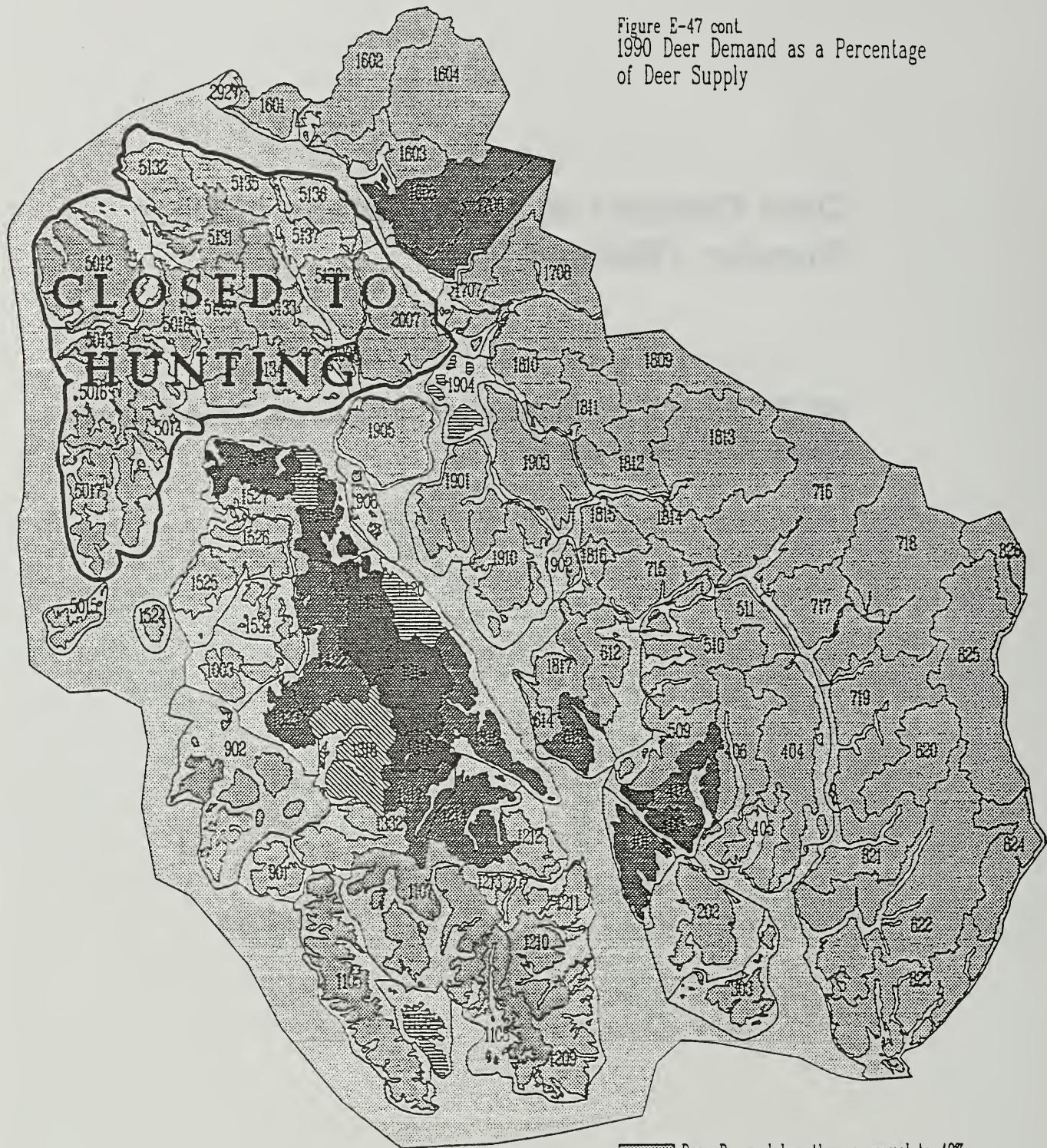


## **Deer Demand as a Percentage of Deer Supply: 1990 and 2040**

SOURCE: ADF&G Division of Subsistence, Toss Analysis  
Maps, Chatham Area GIS

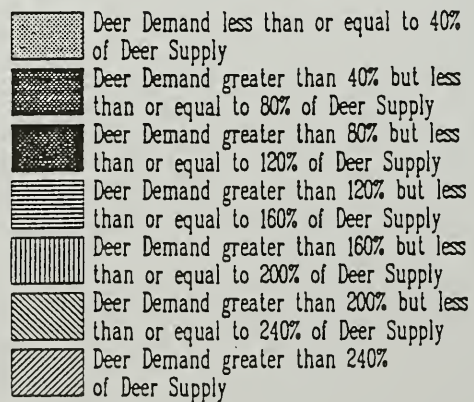


Figure E-47 cont.  
1990 Deer Demand as a Percentage  
of Deer Supply



0 12.5 25 Miles

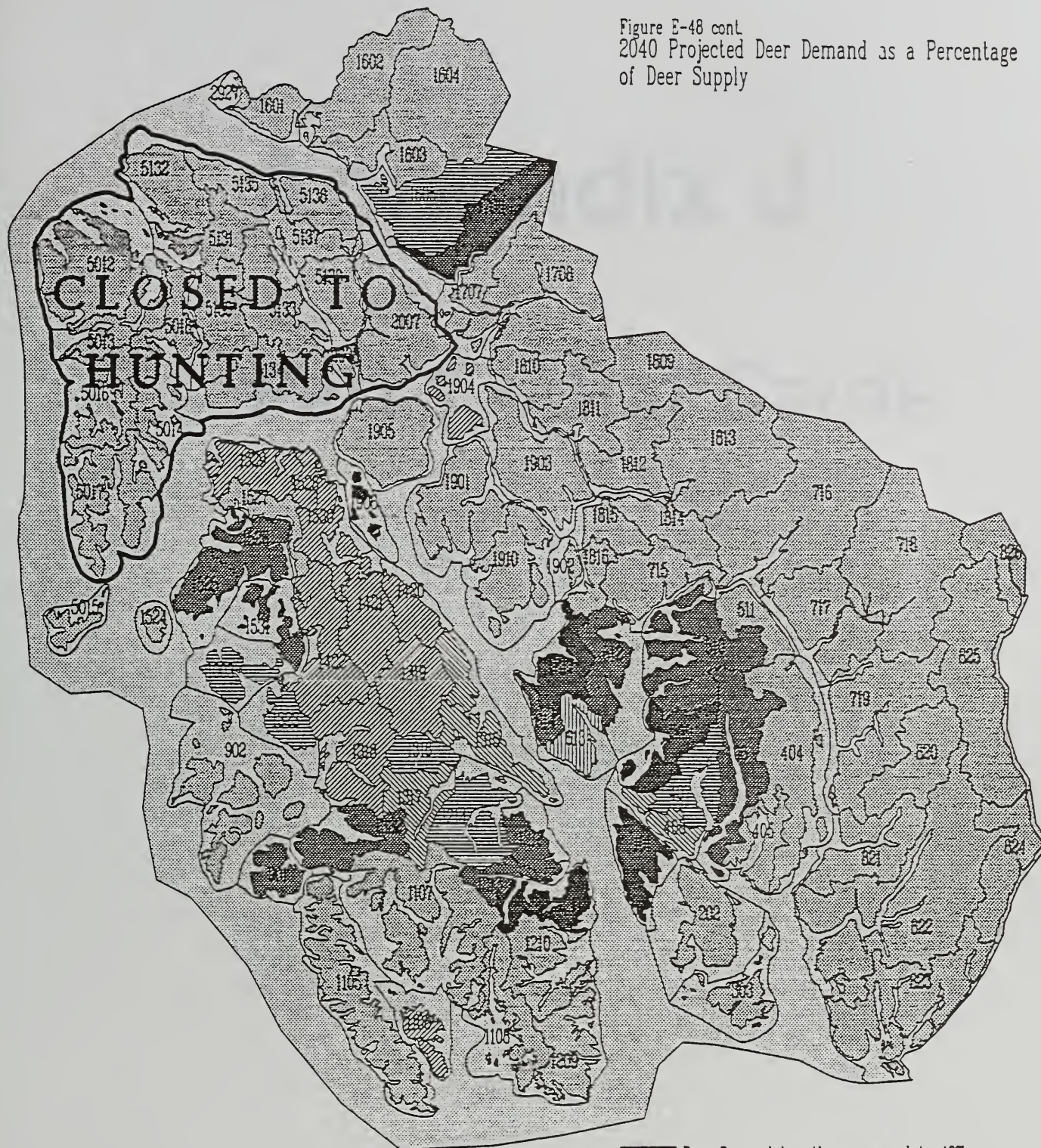
Note: This map displays deer demand (projected harvest) as a percentage of the 1990 deer supply (10% of the habitat capability) for each Wildlife Analysis Area (WAA). Areas where demand for deer exceeds 120 percent of the WAA supply, indicate that existing deer habitat is not sufficient to sustain present harvest levels. Harvest data is from Alaska Dept. of Fish and Game (ADF&G) 1987-1990 deer hunter surveys; deer habitat capability estimates are from the Tongass Land Management Plan Revision (TLMP).  
Source: ADF&G Div. of Subsistence Toss Analysis Map III, Chatham Area GIS.



PLOTTING DATE: 13 Aug 92 14:28:48 Thursday



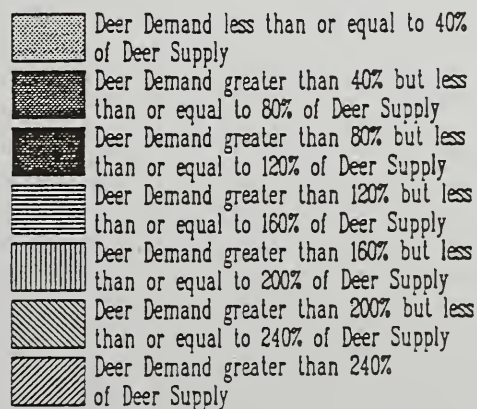
Figure E-48 cont.  
2040 Projected Deer Demand as a Percentage  
of Deer Supply



0 12.5 25 Miles

Note: This map displays deer demand (1987-90 mean harvest) versus deer supply (10% of habitat capability) 50 years from now for each Wildlife Analysis Area (WAA). Demand is assumed to increase with projected population growth at 1.5% per decade through 2010 and 1.5% per decade through 2040. Areas where demand for deer exceeds 120 percent of the WAA supply, indicate that existing deer habitat is not sufficient to sustain present harvest levels. Harvest data is from Alaska Dept. of Fish and Game (ADF&G) 1987-1990 deer hunter surveys; deer habitat capability estimates are from the Tongass Land Management Plan Revision (TLMP).

Source: ADF&G Div. of Subsistence Toss Analysis Map 112, Chatham Area GIS



PLOTTING DATE: 23 Aug 92 15:02:58 Thursday





| Item | Quantity | Unit |
|------|----------|------|
| 1    | 100      | kg   |
| 2    | 50       | kg   |
| 3    | 25       | kg   |
| 4    | 10       | kg   |
| 5    | 5        | kg   |
| 6    | 2        | kg   |
| 7    | 1        | kg   |
| 8    | 1        | kg   |
| 9    | 1        | kg   |
| 10   | 1        | kg   |

| Item | Quantity | Unit |
|------|----------|------|
| 11   | 100      | kg   |
| 12   | 50       | kg   |
| 13   | 25       | kg   |
| 14   | 10       | kg   |
| 15   | 5        | kg   |
| 16   | 2        | kg   |
| 17   | 1        | kg   |
| 18   | 1        | kg   |
| 19   | 1        | kg   |
| 20   | 1        | kg   |

# **Appendix J**

## **Part 1 - Unit Cards**

# Appendix 1

## Part 1 - Unit Cards



## Acronymns and Symbols Used on Unit Cards

|            |  |
|------------|--|
| A or AC    | acre                                     |
| AHMU       | aquatic habitat management unit          |
| B/W or B&W | blue/white                               |
| BDRY       | boundary                                 |
| BMP        | Best Management Practice                 |
| CC         | clearcut                                 |
| CMT        | culturally modified tree                 |
| CRG        | Craig                                    |
| DBH        | diameter at breast height                |
| DF         | directional falling                      |
| E          | east                                     |
| ELEV       | elevation                                |
| FS         | full suspension                          |
| G/W or G&W | green/white                              |
| GS         | group selection                          |
| GIS        | geographic information system            |
| HE         | helicopter yarding                       |
| KTN        | Ketchikan                                |
| MBF        | thousand board feet                      |
| MGMT       | management                               |
| MMI        | mass movement index                      |
| MOD        | moderate                                 |
| MOU        | memorandum of understanding              |
| N          | north                                    |
| O/W or O&W | orange/white                             |
| OSR        | overstory removal                        |
| PC         | partial cut                              |
| PCT        | precommercial thinning                   |
| PS         | partial suspension                       |
| PVT        | private                                  |
| RS         | running skyline                          |
| RSDEIS     | Revised Supplement to the Draft EIS TLMP |
| S          | south                                    |
| SH         | shovel yarding                           |
| SILVI      | silviculture                             |
| SL         | slack line                               |
| SY         | split yarding                            |
| TES        | threatened/endangered/sensitive species  |
| TLMP       | Tongass Land Management Plan             |
| TPA        | trees per acre                           |
| TTRA       | Tongass Timber Reform Act                |
| VCU        | value comparison unit                    |
| W          | west                                     |
| YC         | yellowcedar                              |

# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 674-213      ACRES: 51      VOL: 1830      MBF      ALTERNATIVES: 3,5,6

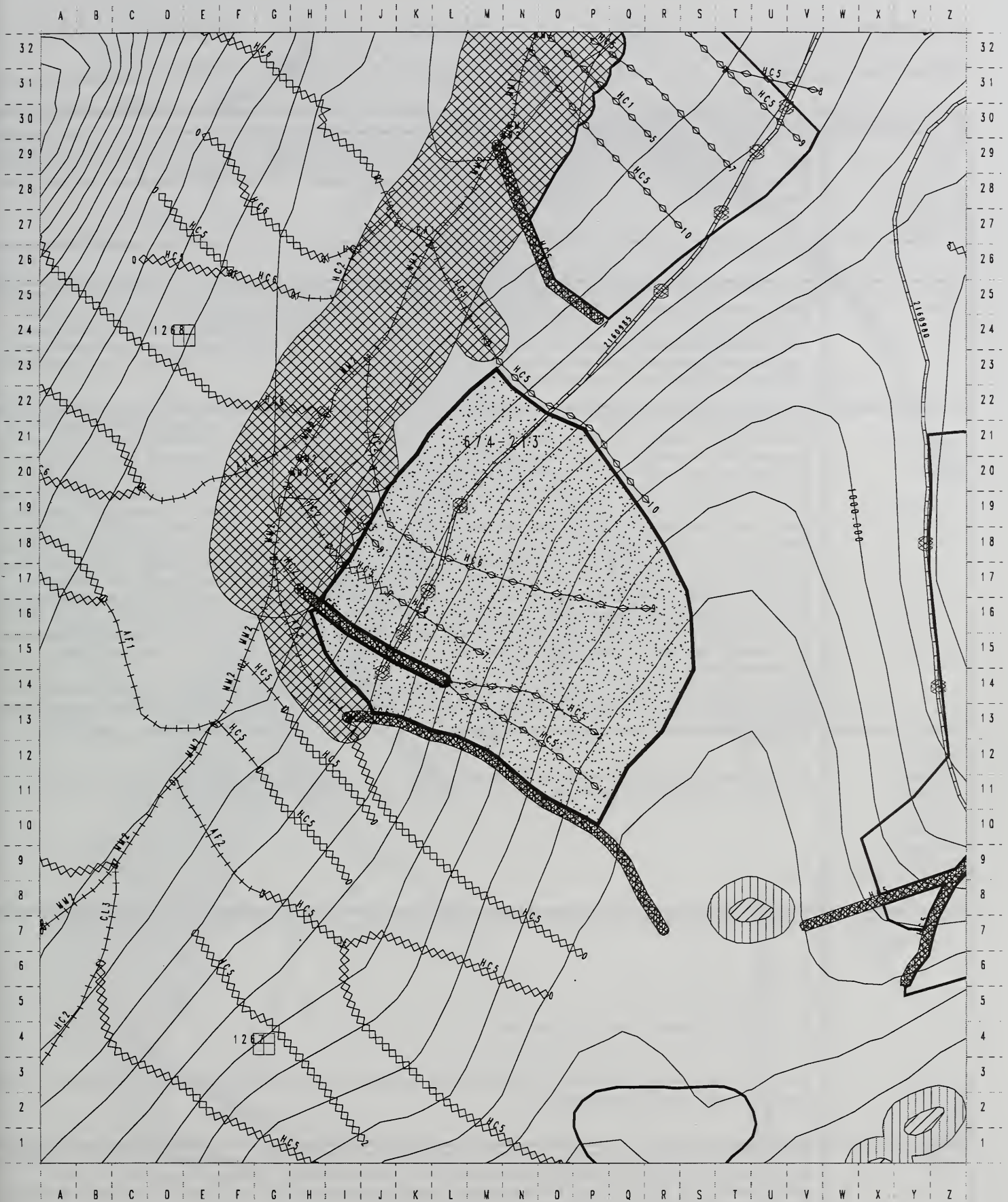
PHOTO YR/#: '91-590-65,64      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: SL,RS,HEL

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67404-009 Windthrow potential is high. Productivity of site is high. Difficult terrain - potential blind leads in lower portion. Verify feasibility and modify unit bdry as required. Profiles needed. Midslope and/or upperslope road need verification. Unit has been expanded to the east and north (leave setting between units). Dropped lower portion due to blind leads and buffer. Avoid unstable chutes. Split-yarding required on stream. Suspension requirements (see soils or fish). Buffers (see fisheries). Unit changed to provide proportionality of volume classes.  |
|   | ROADS:   |
| R.Johnson<br>8/04/95  | SOILS/WATERSHED: Place lower boundary above 310' elevation to protect riparian and floodplain (BMPs 12.6, 12.6a, 12.4). Elevation is that measured in the field, but may not correspond to that shown on the unit map. Recommend partial suspension for MMI3, small areas of MMI4 too small to delete and a few areas with slopes >75% (BMP 13.5, 13.9). Third order watershed (H21A). Probable blowdown of slope break plus 25' buffer prescribed by fisheries on upper portion of stream #3. Recommend instead only a slope break buffer (BMP 13.16). Additional information filed in the reconnaissance folder.   |
| K. McCartney,<br>J. Hannon,<br>6/30/95<br>K.McCartney,<br>M. Solomon,<br>S. Deck,<br>B. Johnston<br>6/28/96 | FISHERIES: Cannery Creek is a Class I and II blue/ white TTRA that requires a 300' buffer (BMP 12.6). Stream 1 is a class IV green/ white. Stream 2 is a class IV green/white; below the junction with stream 1, stream 2 is a class III orange/white. Stream 2 is 6 feet wide, has 8 feet of incision, and an average gradient of 57%. Stream 2 requires a slope break buffer. Near its confluence with Cannery creek, stream 3 is a class II blue/white that will require a 120' TTRA buffer (BMP 12.6). Above this, stream 3 was originally classified as a class III orange/white under the old definition, under the new TLMP (1997) standards it is now a class IV orange/ white. Stream 3 is 4 feet wide, has 3 feet of incision and a gradient of 9%. A slope break buffer is required for stream 3. Stream 7 is a class IV green/white; below 750' of elevation stream 7 was classified as a class III orange/white under the old stream classification system, under the new TLMP (1997) standards it is a class IV orange/white because stream 7 is 2 feet wide, has 3 feet of incision, and an average gradient of 35%. Stream 7 is flagged orange/ white to provide additional resource protection. Stream 8 was classified as a class III orange/white under the old stream classification system, under the new TLMP (1997) standards stream 8 is a class IV orange/ white because it is 3 feet wide, has 2 feet of incision, and an average gradient of 25%. Stream 8 is flagged orange/ white to provide additional resource protection. Below the unit stream 8 is a class II blue/white TTRA stream. Stream 9 was classified as a class III orange/white under the old stream classification system, under the new TLMP (1997) standards stream 9 is a class IV green/ white because it is 2 feet wide, has 10 feet of incision, and an average gradient of 58%. Stream 9 is flagged orange/ white to provide additional resource protection. Stream 10 was classified as a class III orange/white under the old stream classification system, under the new TLMP (1997) standards stream 10 is classified as a class IV orange/ white because stream 10 is 3 feet wide, has 3 feet of incision, and an average gradient of 7%. Stream 10 is flagged orange/ white to provide additional resource protection.<br>The orange/white streams require directional falling, split yarding or full suspension, and immediate cleaning of introduced debris from the channel (BMP 13.16). The green and white streams require directional falling, and split yarding (where practical) or partial suspension. Clean green/ white streams of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16). |
|   |  |
| D.Parker,<br>M.Pacheco, J.<br>Wrate 6/20/95<br>B.Johnston<br>6/28/96  | WILDLIFE:<br><br>Deer forage and sign seen throughout. Bear sign also common. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/28/96 Prolific deer and bear sign at beaver ponds along SW edge of unit. Deer bones along stream.  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br>LANDS:  |
| T.Fifield<br>10/28/97   | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.   |
| J.Short<br>12/17/97   | VISUALS: To meet modification VQO(upper), retain about 6 randomly scattered 1 acre islands along the backline of the unit and along the SW boundary of the unit to soften the pronounced edge created by these boundaries.   |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10 - 20% of volume. Use: type D clear-cut. This applies to bottom 2/3 of unit and is cable logged. Slackline above and running skyline below road. Upper 1/3 of unit is helicopter logged and is partial cut for VQOs in the form of four retention patches across the top of the unit to feather the visuals. The streams could be used as the retention strips. Layout as windfirm as possible. Retention trees could be less than 18" DBH. PCT in 15 years. Road closure after sale. Actual acres cut of partial cut area is 1/3 to 1/2. Option to helicopter log if road is infeasible. Cannery Creek is major salmon producer. Monitor regeneration at high elevation.  |



# Chosina Study Area Interim Layout NOI Unit 674-213

Mapscale 1:7920 (8 inch to Mile)



- |                       |                            |                                      |                    |
|-----------------------|----------------------------|--------------------------------------|--------------------|
| Class 1 Stream        | Saltwater                  | No Cut Stream Buffers                | Proposed Landings  |
| Class 2 Stream        | Fresh Water Lake           | Variable Width No Cut Stream Buffers | Existing Temp Road |
| Class 3 Stream        | 1000' No Cut Beach Buffers | Variable Width No Cut Karst Buffers  | Proposed Temp Road |
| Class 4 Stream        | No Cut Lake Buffers        | Alternative To Clearcutting Units    |                    |
| Existing Roads        | Partial Cut Lake Buffers   |                                      |                    |
| Proposed Roads        |                            |                                      |                    |
| Unit Boundary         |                            |                                      |                    |
| Susp/Yarding Boundary |                            |                                      |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 674-265      ACRES: 25      VOL: 675      MBF      ALTERNATIVES: 3,5,6

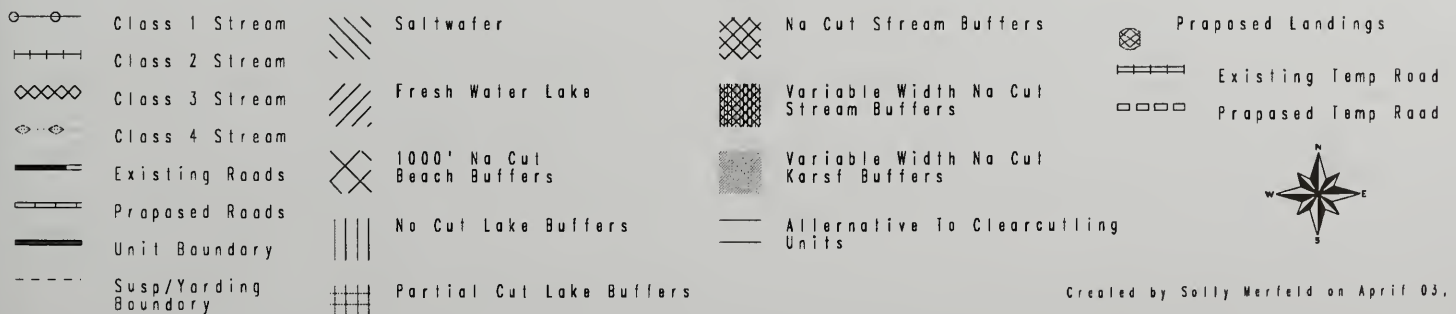
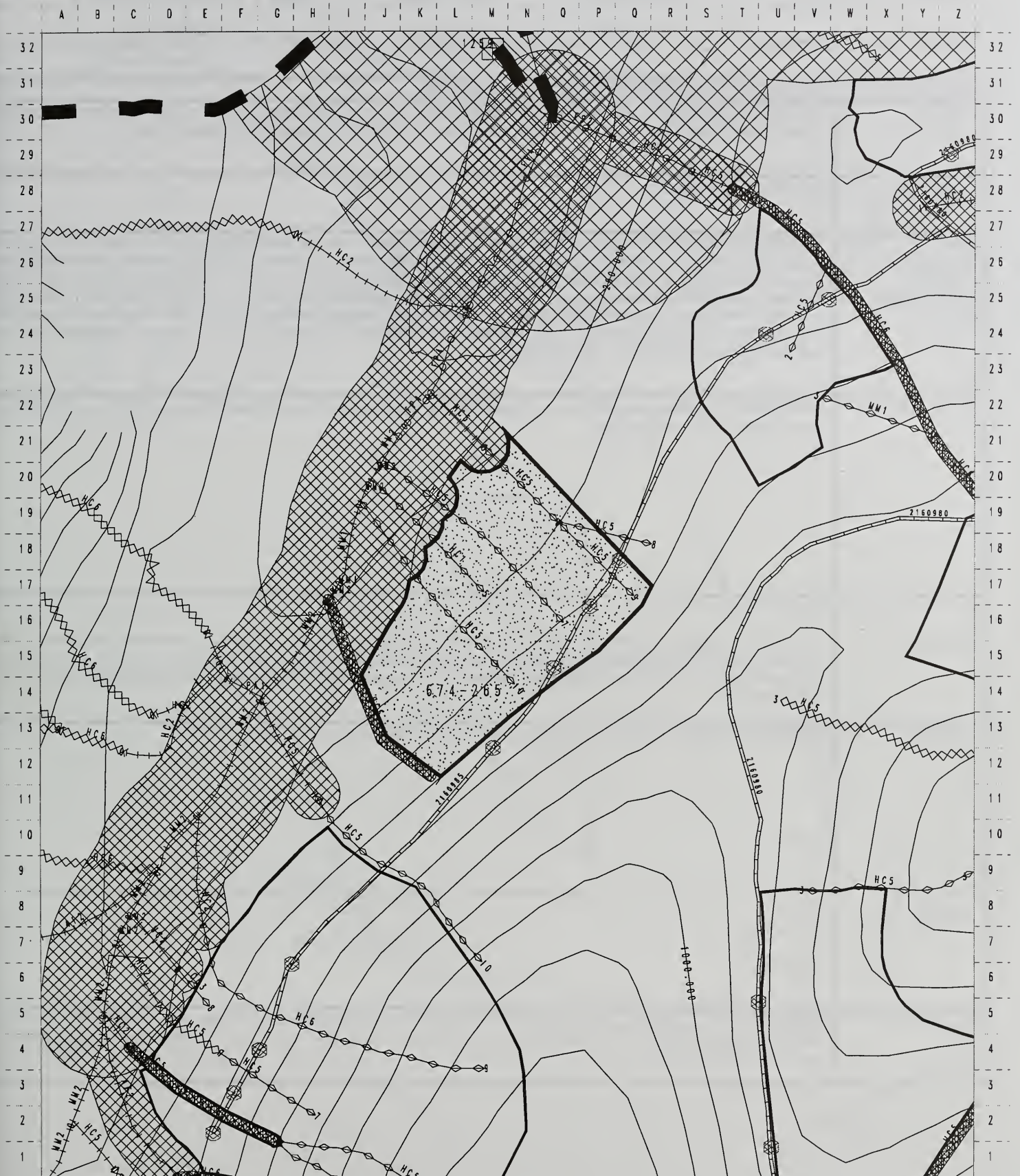
PHOTO YR/#: '91-590-65      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: SL, HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67404-009. Productivity of site is moderate, moderate windthrow risk, difficult terrain - potential blind leads in lower portion. Profiles needed. Avoid unstable chutes. Buffers (see fisheries): Class III buffers for retention needs. Unit has adequate buffer at bottom. Upper road and upper 1/2 of unit dropped for very high MMI soils already. Interior streams down-classed to IV  |
|  | ROADS: No concerns.   |
| R.J<br>8/04/95   | SOILS/WATERSHED: Place lower boundary above a line from 260' elevation in the southwest corner to 200' in the northwest corner to protect riparian and floodplain (BMPs 12.6, 12.6a 12.4). Upper boundary is an irregular line between 500' and 600' elevation (BMP 13.9; TLMP 1997). Elevations were measured in the field and may not correspond to those shown on the unit map. Recommend partial suspension for MMI3 and McGilvery (BMP 13.9; TLMP 1997). Recommend O & W protection for upper portions of streams in unit because of MMI4 and unstable side slopes (BMP 13.5, 13.16). Third order watershed (H21A). Additional information filed in the reconnaissance folder.   |
| K.Buckley,<br>K.Kitchel<br>6/28/96   | FISHERIES: Require a 300' TTRA buffer on Cannery Creek (BMP 12.6). NOTE: Stream 8 is flagged class II orange/white at its confluence with Cannery Creek; it should be flagged class II blue/white and requires a 120' TTRA buffer (BMP 13.16). At 180' elevation stream 8 changes to a class III orange/white. Stream 8 was classified as a class III orange/white under the old stream classification system, under the new TLMP (1997) standards stream 8 is a class IV orange/ white because it is 3 feet wide has 7 feet of incision and 15% gradient. Stream 8 is flagged orange/ white to provide additional resource protection. At an elevation of 260', stream 8 changes to a class IV green/white. Stream 9 is a class IV green/white. Stream 7 was classified as a class III orange/ white under the old stream classification system, under the new TLMP (1997) standards stream 7 is a class IV orange/ white. Stream 7 is 3 feet wide has 7 feet of incision and 15% gradient. Stream 7 is flagged orange/ white to provide additional resource protection. Stream 5 was classified as a class III orange/ white under the old stream classification system, under the new TLMP (1997) standards stream 5 is a class IV orange/ white. Stream 5 is 3 feet wide has 3 feet of incision and 10% gradient. Stream 5 is flagged orange/ white to provide additional resource protection. Stream 10 was classified as a class III orange/white under the old stream classification system, under the new TLMP (1997) standards stream 10 is a class IV orange/ white. Stream 10 is 2 feet wide has 3 feet of incision and 20 %gradient. Stream 10 is flagged orange/ white to provide additional resource protection. Stream 11 is a class III orange/white Stream 11 is 10 feet wide has 13 feet of incision and 37% gradient. Stream 11 requires a slope break buffer.<br>The orange/white streams require directional felling and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/white streams require directional felling and split yarding (where practical) or partial suspension (BMP 13.16). |
| D.Parker,<br>M.Pacheco,<br>J.Wrate<br>6/20/95<br>C.Tighe,<br>B.Johnston<br>6/28/96 | WILDLIFE:<br><br>Deer forage throughout unit. Deer and bear sign seen throughout unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/28/96 Lots of bear sign in NW part of unit.  |
| T.Fifield, J.Short<br>5/96. J.Baichtal   | GEOLOGY/MINERALS: Unit visited by Forest Geologist. No known geology minerals, or karst resources concerns.<br><br>LANDS:<br><br>CULTURAL: This unit will be surveyed in 1996.  |
| J.Short<br>12/17/97  | VISUALS: To meet modification VQO retain about 5 randomly scattered 1 acre islands along the backline of the unit to soften the pronounced edge created by this boundary.   |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe on lower 3/4 of unit. Retain 3-4 one acre leave patches on upper end of unit for meeting VQOs. Place these between landings and above road. Consider windthrow risk. Use: type B clear-cut. Meet suspension requirements (see soils). PCT at 20 years. Close road after yarding. Option to helicopter log if road is infeasible.  |



# Chasino Study Area Interim Layout NOI Unit 674-265

Mapscale 1:7920 (8 inch to Mile)



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 677-301      ACRES: 10      VOL: 500      MBF      ALTERNATIVES: 6

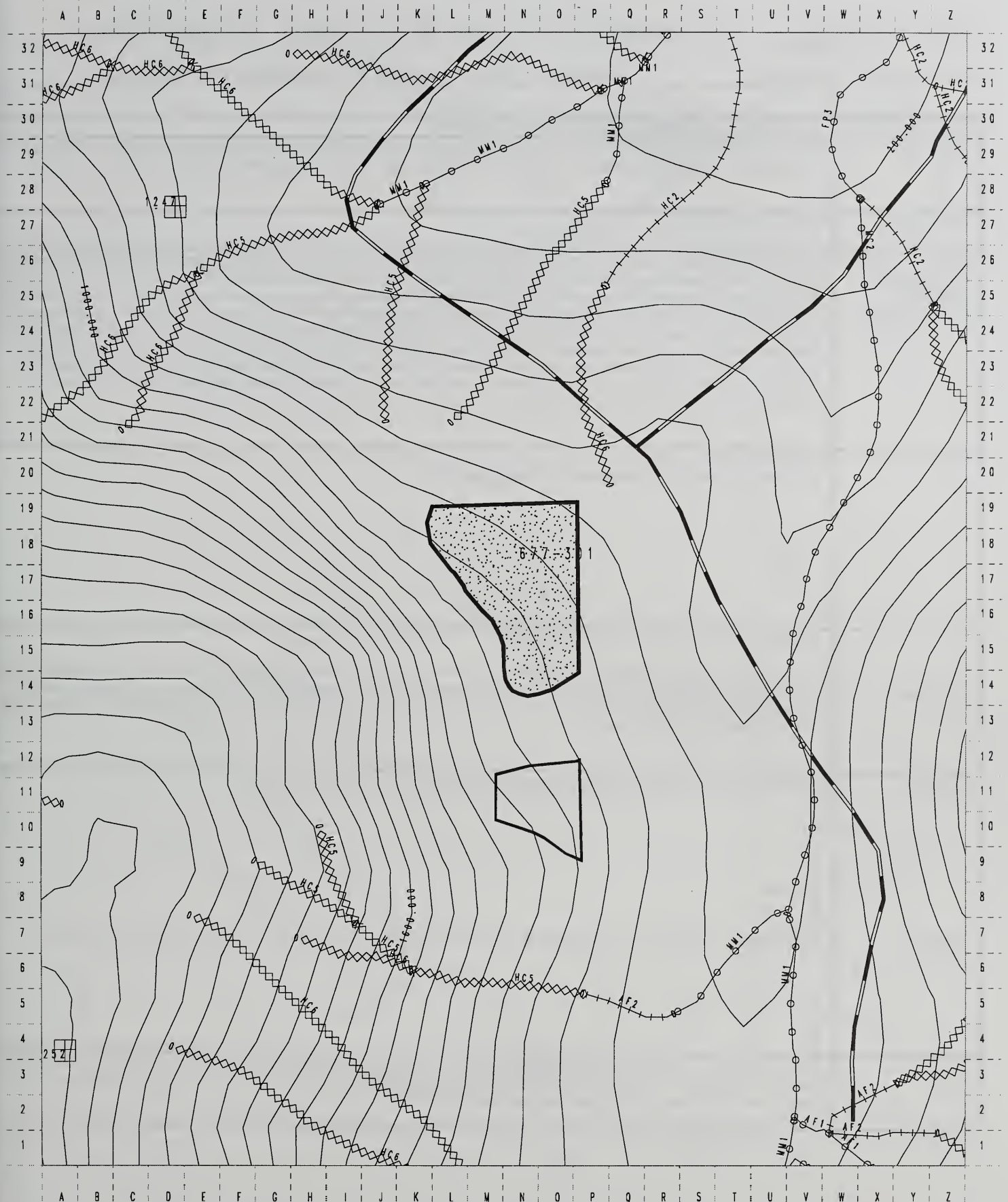
PHOTO YR/#: '91-590-142      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                                      | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97                                  | SILVICULTURE/TIMBER: 67701-021, high windthrow risk, mod. elev. Productivity of site is high. Adjacent to private land. Windy funnel valley edge. Avoid steep slopes. Isolated stand, should only be logged with adjacent units.   |
| J.Oien<br>5/96                                     | ROADS: No concerns.  |
| Field<br>D.J.Landwehr<br>10/18/95<br>EIS R.Johnson | SOILS/WATERSHED: Soil Tolstoi. Slopes 30-90%. Approximately 4 acres on slopes greater than 75 % below cliff. High MMII soils in most of the unit. Minimum partial suspension required throughout unit (BMP 13.9). Full suspension should be achieved via prescribed helicopter yarding. One class III stream in the avalanche area south of the unit needs O&W protection (directional fall, split yard or full suspension over, and immediately clean out introduced debris; BMP 13.16). Small intermittent stream in the northeast corner of the unit does not need protection with helicopter yarding. The unit is in third order watershed H42A, which will have about 15% cumulative effect under alternative 6 per GIS (BMP 12.1; TLMP 1997). This value is suspected of being too low due to the amount of harvest on Private land. |
| K. Buckley, 7/96                                   | FISHERIES: No streams found in the unit. Orange/white stream identified by soils is thought to be outside the unit but recommend protection described by soils.  |
|  |  |
| M.Dillman 7/96                                     | WILDLIFE:<br><br>To provide for adequate snag density and distribution within the VCU, recommend leaving a 0.1 acre or larger snag patch for each 10 acres of unit. Recommend leaving live reserve trees where possible to maintain habitat structure. This unit did not rate as a high priority unit for wildlife due to the habitat requirements in the current goshawk protocols. Therefore, wildlife did not survey in 1995 or 1996.   |
| J.Baichtal   | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                              | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12 97                                  | PRESCRIPTION: Clear-cut w/ reserves; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use: type C clear-cut helicopter logging. Too isolated for PCT.  |



# Chosina Study Area Interim Layout NOI Unit 677-301

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 677-302      ACRES: 3      VOL: 60      MBF      ALTERNATIVES: 6

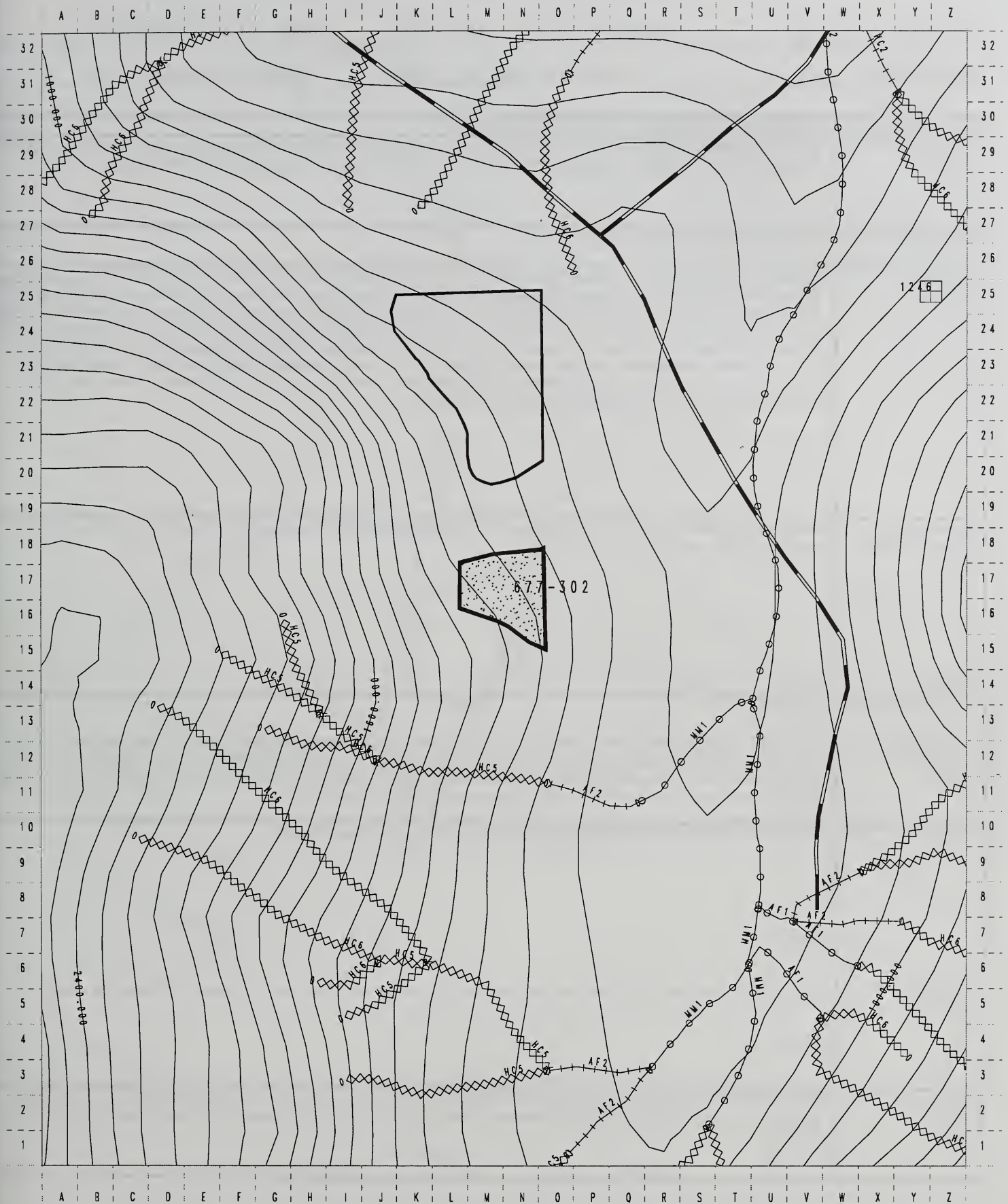
PHOTO YR/#: '91-590-142      1.4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                                      | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97                                  | SILVICULTURE/TIMBER: 67701-017, high windthrow risk, high elev. Productivity of site is low, very steep, rocky with slides adjacent. Adjacent to private land. Windy funnel valley edge. Isolated, only log with adjacent units.  |
| J. Oien 5/96                                       | ROADS: No concerns.   |
| Field<br>D.J.Landwehr<br>10/18/95<br>EIS R.Johnson | SOILS/WATERSHED: Soils Tolstoi, McGilvery, Remedios, and Kaikli. Slopes 40 to 100%. Approximately 1 acre of forested wetland. About 2 acres high MMI soils. A minimum of partial suspension is required (BMPs 12.5, 13.9; TLMP 1997). Full suspension should be achieved via prescribed helicopter yarding. Recommendation to drop approximately 4 A. very thin McGilvery on talus slopes greater than 75% in south portion of unit, has been done (TLMP 1997). Two class III streams, one on the north and one on the south boundary, need O&W protection (directional fall, split yard or full suspension, clean out introduced debris immediately; BMP 13.16). A small intermittent stream flowing from the forested wetland does not need protection with helicopter yarding. The unit is in third order watershed H42A, which will have about 15% cumulative effect under alternative 6 per GIS (BMP 12.1; TLMP 1997). This value is suspected of being low due to the amount of harvest on Private land. Defer harvest on Kaikli soils (TLMP 1997). Potential add about one A in northwest corner; backline at base of large cliff. |
| K.Buckley 7/96                                     | FISHERIES: Streams identified by soils are thought to be outside the unit boundaries. However, if they are within the unit boundaries, follow the soils prescriptions for stream protection.  |
| M.Dillman<br>7/96                                  | WILDLIFE:<br><br>To provide for adequate snag density and distribution within the VCU, recommend leaving a 0.1 acre or larger snag patch for each 10 acres of unit. Recommend leaving live reserve trees where possible to maintain habitat structure. This unit did not rate as a high priority unit for wildlife because its elevation is above that recommended in the current goshawk protocol. Therefore, wildlife did not survey in 1995 or 1996.   |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96                              | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                                  | PRESCRIPTION: Unsuitable soils, drop from timber base. Clear-cut w/ reserves: retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use: type C clear-cut, helicopter logging. Too isolated for PCT.   |



# Chasina Study Area Interim Layout NOI Unit 677-302

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

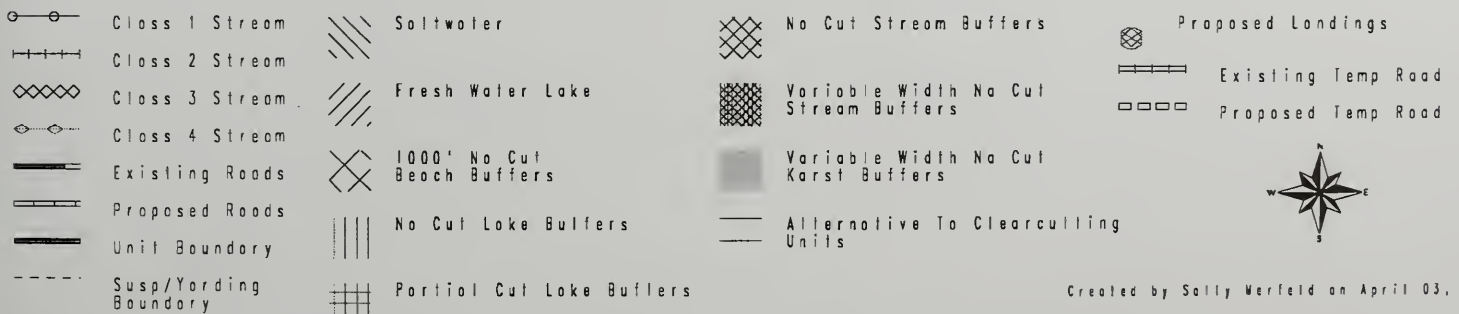
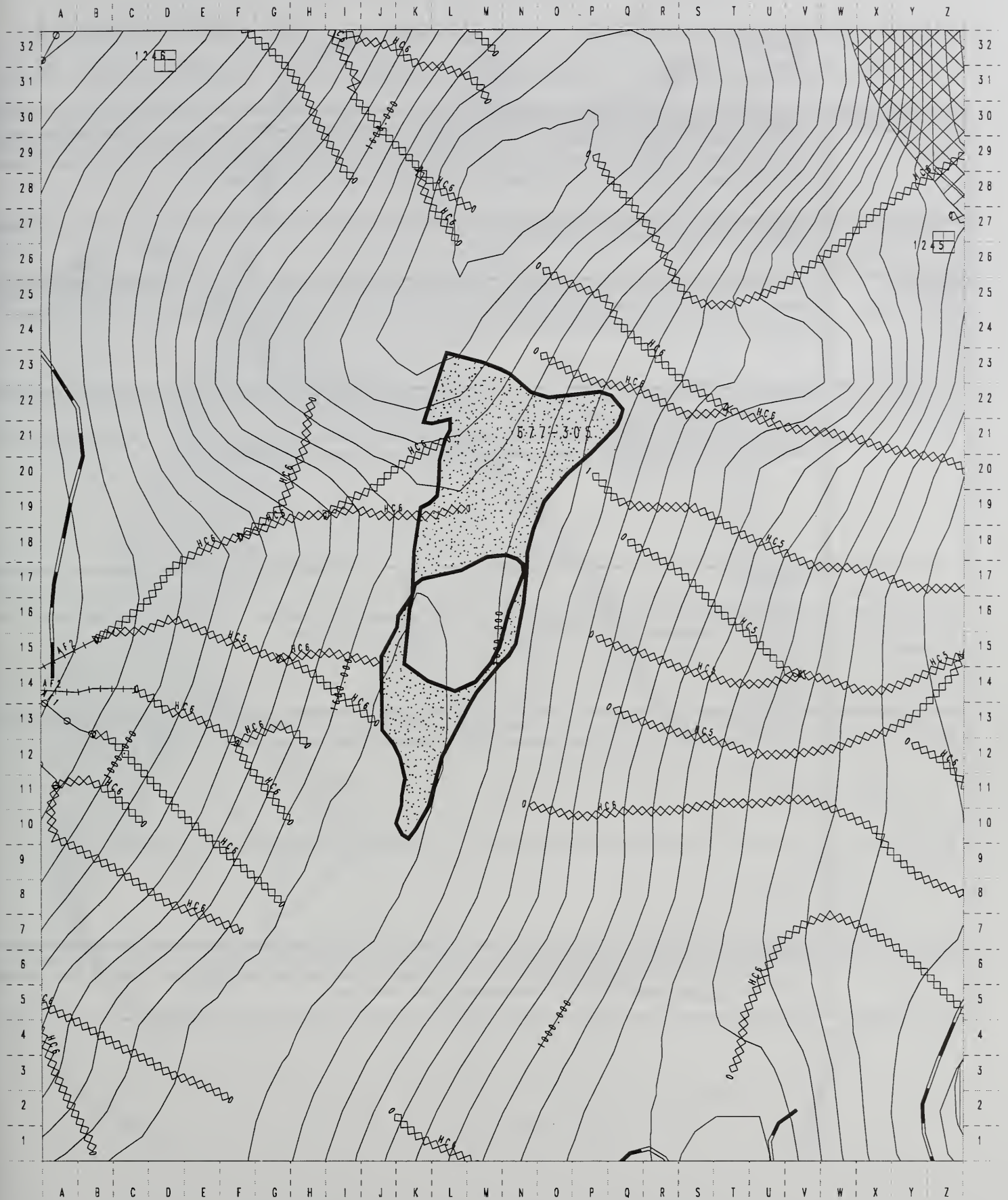
VCU-UNIT#: 677-305 ACRES: 19 VOL: 485 MBF ALTERNATIVES: 6

PHOTO YR/#: '72-40-142 1/4 QUAD: CRG A-1 NW 1/4 LOGGING SYSTEMS: HE

| REVIEWER&DATE                                | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97                            | SILVICULTURE/TIMBER: 67702-4, high windthrow risk, high elev. Productivity of site is low. Adjacent to private land. Surrounding isolated ridgetop. Low value / high defect. Keep unit on ridgetop, avoid steep slopes surrounding.  |
| J. Oien 5/96                                 | ROADS: No concerns.  |
| R.Johnson<br>6/96                            | SOILS/WATERSHED: Soils mapped 528D (Tolstoi - McGilvery 35-60%), with 29EF (McGilvery 60-100%). Partial suspension for McGilvery (TLMP 1997). Helicopter prescribed. Unit basically top of ridge. Deletions by silviculture include steep McGilvery NW corner and steep MMI4 on W side (BMP 13.5; TLMP 1997). E boundary at break from flatter top to steep slopes below for MMI4 and McGilvery (BMP 13.5; TLMP 1997). Probable O&W protection needed headwaters class III streams both E and W sides of ridge (BMP 13.16). Fisheries reported till, unstable soil and a landslide in the unit. Field review recommended during layout for deletion of additional unsuitable lands (BMPs 13.2, 13.5). Unit is in watershed H42A and H41A, which will have about 15% and 6% cumulative effects respectively under alternative 6 per GIS (BMP 12.1; TLMP 1997). These values are suspected of being too low due to the amount of harvest on Private lands. |
| K.McCartney, K. Kitchel, S. Deck.<br>6/19/96 | FISHERIES: Stream 1 is a class III orange/ white that requires directional falling, and split yarding or full suspension. Remove introduced debris immediately (BMP 13.16).  |
| M.Dillman<br>7/96                            | WILDLIFE:<br><br>To provide for adequate snag density and distribution within the VCU, recommend leaving 0.1 acre or larger snag patch for each 10 acres of unit. Recommend leaving live reserve trees where possible to maintain habitat structure. This unit was not a high priority unit for wildlife. The steepness and elevation of this unit were over that which is called for in the current goshawk protocol. Wildlife did not survey unit in 1995 or 1996. Estuary requires 1000 foot buffer.  |
| J.Baichtal                                   | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                        | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                            | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use: type C clear-cut. Too isolated for PCT.   |

# Chosina Study Area Interim Layout NOI Unit 677-305

Mapscale 1:7920 (8 inch = 1 mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 678-301      ACRES: 14      VOL: 630      MBF      ALTERNATIVES: 3,5,6

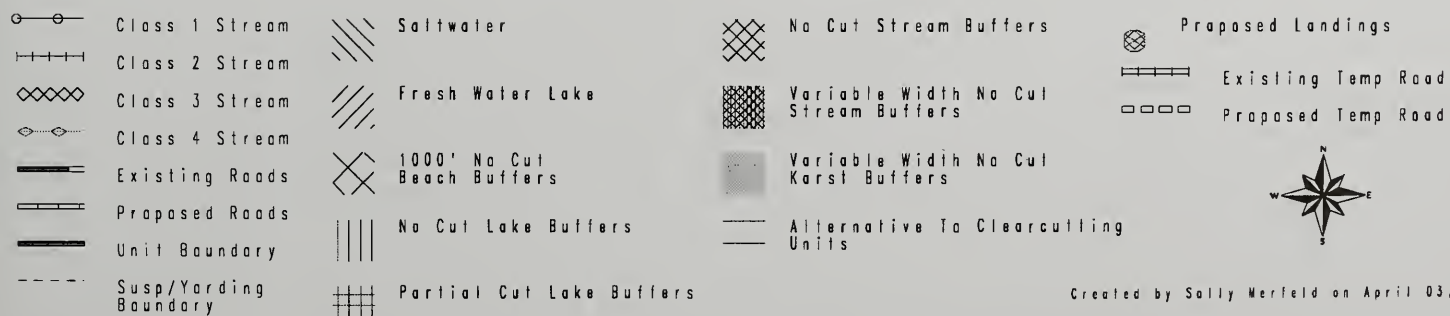
PHOTO YR/#: '91-590-65      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67404-009, low windthrow risk, portion downhill yarded. Productivity of site is high. Option to extend unit uphill to meet road for uphill yarding potential. Buffers (see fisheries). Leave setting between adjacent unit. Suspension requirements (see soils or fish). Unit changed to provide proportionality of volume classes.  |
| J. Oien 5/96   | ROADS: Avoid Karst formations when possible.  |
| R.Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped as 32D and 32E (StNicholas 35-75%). Partial suspension for MMI3 and forested wetland (BMPs 12.5, 13.9). Third order watershed H21A. Field review may be needed during layout to determine if unsuitable conditions exist in the steep portion of the unit (BMPs 13.2, 13.5)   |
| D. Kuntzsch,<br>M. Becker,<br>9/7/95   | FISHERIES: Stream 1 is a class III orange/ white that requires a slope break plus 25' buffer (BMP 12.6). Stream 2 is a class IV green/ white. Stream 3 is a class IV green/white.<br>The green and white streams require directional falling, and split yarding (where practical) or partial over. Clean stream of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16). |
| C.Tighe, J. Wrate,<br>J.Baichtal 6/12/95<br>B.Johnston,<br>G.Lawton<br>5/23/96 | WILDLIFE:<br><br>Deer sign within unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 5/23/96 -Great-horned owl heard in unit. Maintain 1000 foot estuary buffer.   |
| J.Baichtal<br>5/15/96  | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Possibly on Ruby Tuesday Claim Block. Sinking karst stream along NW unit boundary. Pull back unit boundary to protect water quality.  |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Future setting to southwest and northeast. PCT at 15. Monitor potential poor regeneration.  |



Mapscale 1:7920 (8 inch to Mile)

Mapscale 1:7920 (8 inch to Mile)



Created by Sally Merfeld on April 03, 1998



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 678-303 ACRES: 18 VOL: 522 MBF ALTERNATIVES: 3,4,5,6

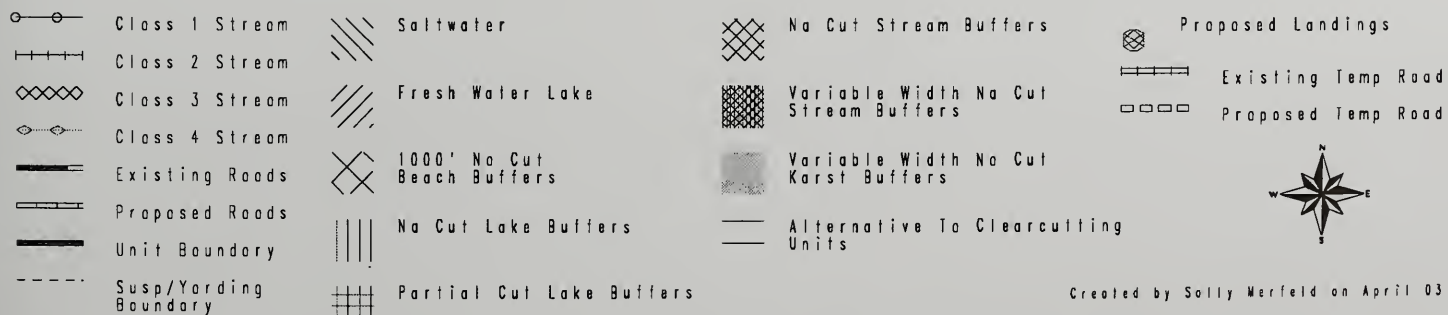
PHOTO YR/#: '91-590-20 1/4 QUAD: CRG A-1 NW 1/4 LOGGING SYSTEMS: RS

[illegible]



# Chosina Study Area Interim Layout N01 Unit 678-303

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

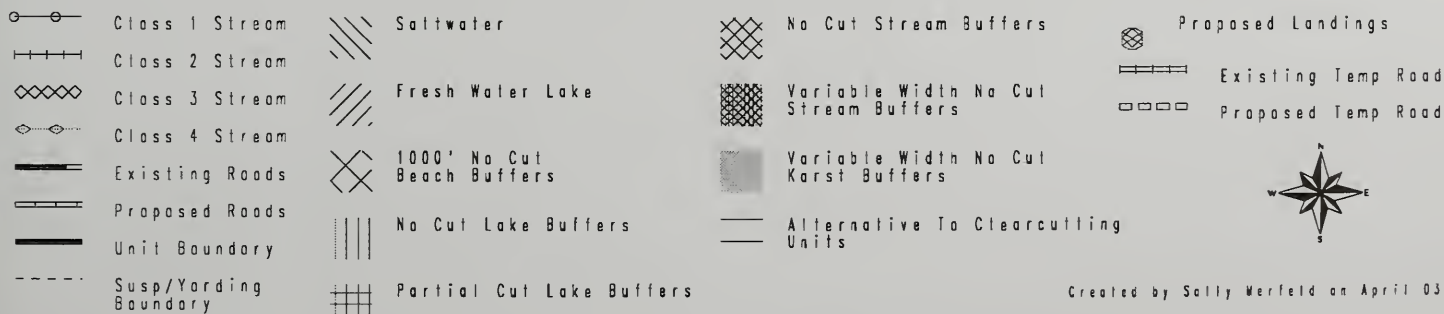
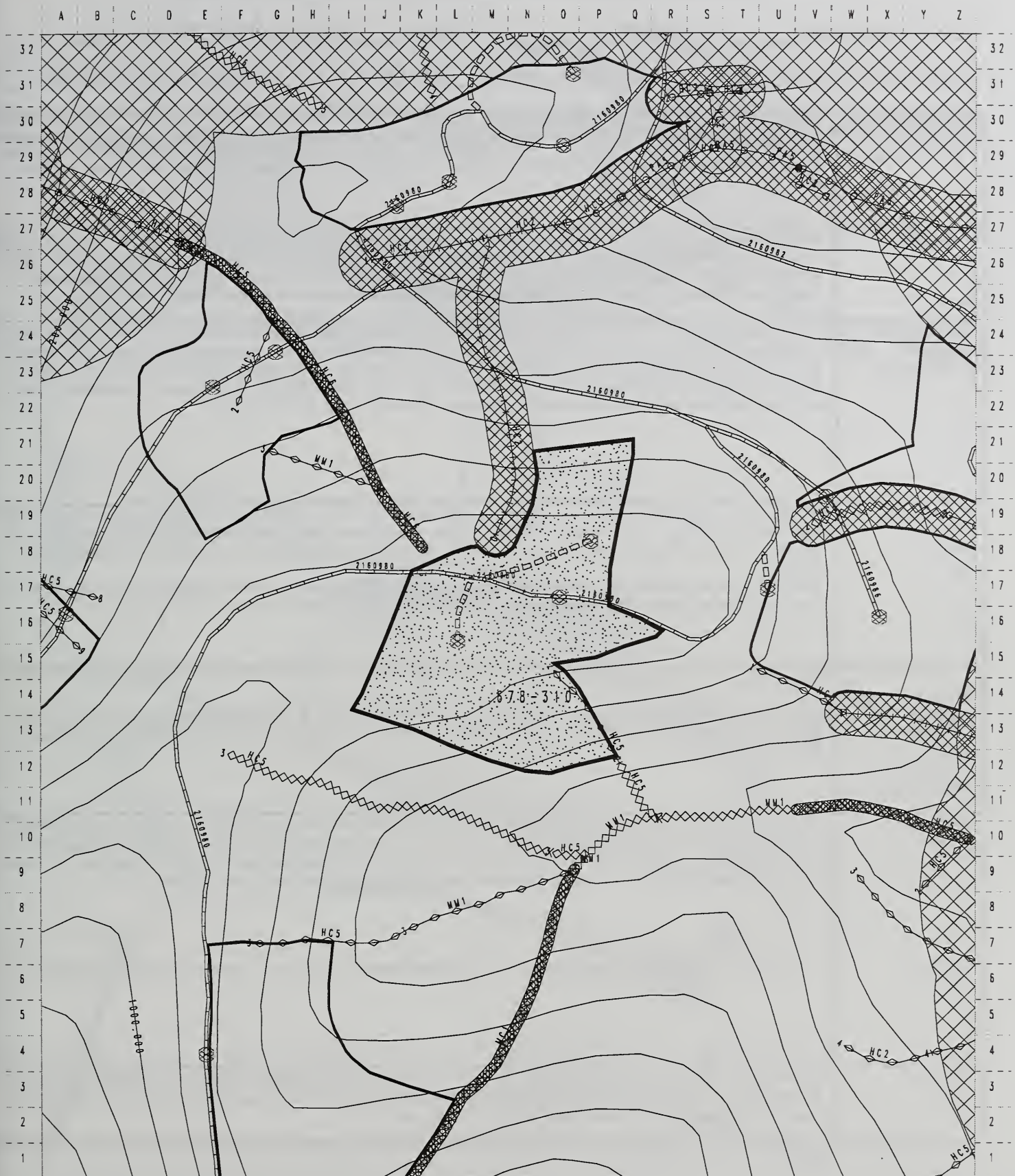
VCU-UNIT#: 678-310 ACRES: 26 VOL: 1215 MBF ALTERNATIVES: 3,4,5,6

PHOTO YR/#: '91-590-65 1/4 QUAD: CRG A-1 NW 1/4 LOGGING SYSTEMS: RS

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67802-019, high windthrow risk. Productivity of site is high. Maintain setting width between units. High mistletoe deflect. Road to southeast dropped.  |
| J. Oien 5/96  | ROADS: Avoid karst formations when possible.   |
| R.Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped primarily 32E (StNicholas 60-75%), with a small amount of 32C (StNicholas 5-35%). Partial suspension for forested wetlands and MMI3 (BMPs 12.5, 13.9). Cliffs reported, which corresponds with photos and confusion of mapping of 29EF. Possible field review needed during layout for deletion of cliffs and partial suspension is required over McGilvery soils and slopes >72% (BMPs 13.2, 13.5; TLMP 1997). Unit in third order watershed H21A and second order watershed EX7A.  |
| K. McCartney,<br>J. Hannon,<br>6/21/95                          | FISHERIES: Recommend that the lower boundary of the unit be no lower than 400' elevation (approximate road line). Stream 1 is a class II orange/ white stream that requires a 100' AHMU buffer (BMP 12.6). Stream should be shocked to check for presence of resident fish. This stream will require fish passage and timing (BMP 14.14). Stream 2 was classified as a class III green/ white, under the new TLMP (1997) system stream 2 is a class IV green/white. Stream 3 (outside the unit) was classified as a class III green/white, under the new TLMP (1997) system stream 3 is a class IV green/white. The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris before the end of the operating season or before the yarder leaves the area (BMP 13.16) |
| M.Dillman,<br>J.Wrate 6/27/95<br>C.Tighe, A.<br>Mueller 6/28/96 | WILDLIFE:<br><br>Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Snags were seen in unit.  |
| J.Baichtal<br>10/22/96  | GEOLOGY/MINERALS:No minerals concerns, access for harvest will improve mineral exploration access. Possibly on Ruby Tuesday Claim Block. Karst cliff reported by engineering recon. Northern edge of unit is by marble. Southern half of unit was not reconned by Forest Geologist, there may be karst developed there, resource concerns should be addressed during layout. Very steep marble slopes/cliffs (i.e. >100%) have very shallow organic soils atop them. These areas would fall into high vulnerability karstlands or McGilvery Soils.   |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : Use type A clear-cut. Partial suspension required for soils protection. Dropped steep areas to the south and northeast for cliffs and karst. Keep road high and open to future settings to the west and southwest. Scarify soil to promote spruce. Minimize mistletoe infected residual hemlock by release treatment and PCT at 15 years.   |

# Chosina Study Area Interim Layout NOI Unit 678-310

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 678-312      ACRES: 30      VOL: 864      MBF      ALTERNATIVES: 3,4,5,6

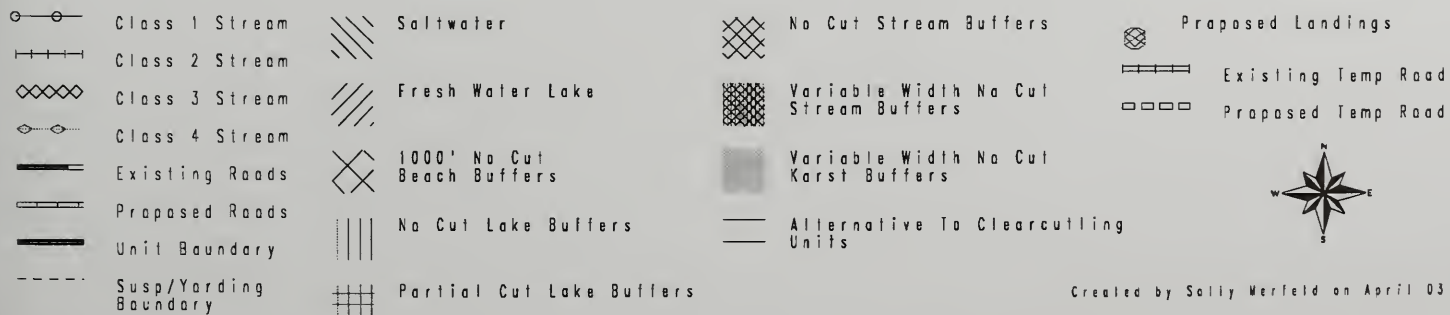
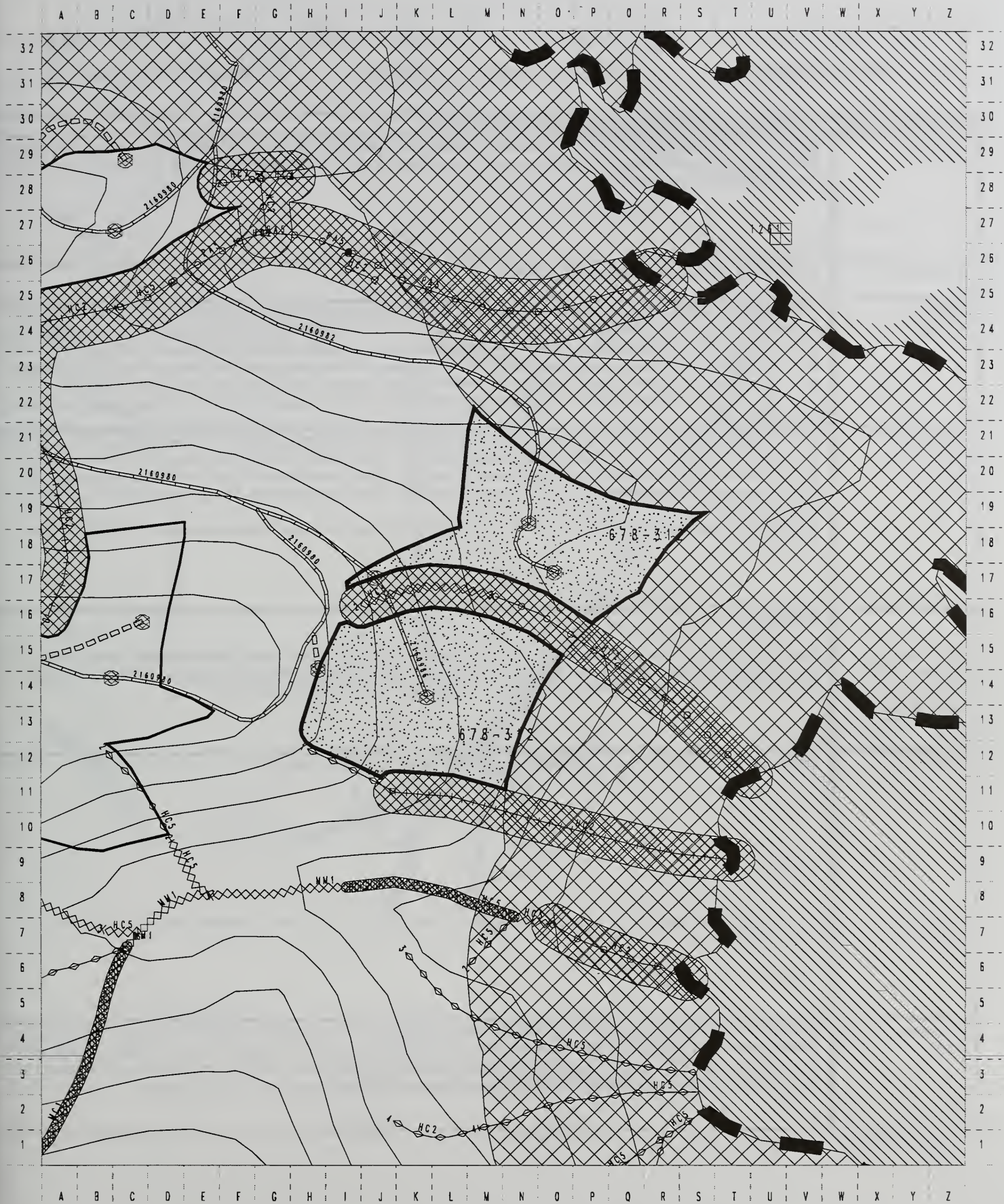
PHOTO YR/#: '91-590-21      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67802-022, high windthrow risk. Productivity of site is moderate. Partial cut buffer. Maintain setting width between units (high volume left). Possibly combine with unit 305. Layout road options with adjacent access in mind.  |
| J. Oien 5/96  | ROADS: Because of karst development within the unit, road construction should minimize clearing limits and disturbance during construction. Road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to the alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated by fall. Quarry placement and development should be approved by both the Forest Geologist and the District Fisheries Staff.   |
| Field P.Krosse,<br>8/01/95<br>EIS R.Johnson                                     | SOILS/WATERSHED: Observed McGilvery, Remedios, and Kupreanof soils. Slopes are 65-85%, plus rock outcrops. Partial suspension for MMI3 and McGilvery (BMP 13.9; TLMP 1997). Limited field review. Karst reported in N end of unit. Portion of unit in second order watershed EX7A. Probable blowdown of 100' buffer on fish stream #2 in center of unit. Recommend slope break buffer with diameter limit cut instead (BMP 13.16). May need field review during layout for mitigation of karst, unsuitable McGilvery soils, and rock outcrops and slopes >72% (BMPs 13.2, 13.5; TLMP 1997).  |
| K. McCartney,<br>J. Hannon,<br>6/20/95  | FISHERIES: Stream 1 was classified as a class III green/ white, under the new TLMP (1997) standards stream 1 is a class IV green/white. Stream 2 is a class I blue/ white TTRA up to the waterfall that requires a 100' buffer (BMP 12.6). Above the waterfall stream 2 becomes a class III orange/ white that needs a 100' buffer due to its location and proximity to fish habitat (BMP 12.6).<br>Green/ white streams requires directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris before the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| D.Parker,<br>J.Wrate,<br>M.Pacheco<br>6/21/95<br>C.Tighe, A.<br>Mueller 5/23/96 | WILDLIFE:<br><br>Deer forage and browsed plants were seen throughout unit. Bear sign seen in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 5/23/96 Wolf scat seen in unit with shells in it. Estuary requires a 1000 foot buffer.  |
| J.Baichtal<br>5/15/96<br>10/22/96   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Possibly on Ruby Tuesday Claim Block. Karst cliff reported by engineering recon. Not visited by Forest Geologist. Suggest Geologist / Soils join visit. Moderate vulnerability karst as a minimum. Partial suspension required on karst portion of unit as a minimum. 10/96 still did not get to unit but based on adjacent geology karst is probable and steep marble cliffs may be found in unit.<br><br>LANDS:  |
| T.Fifield<br>10/28/96   | <del>CULTURAL</del> The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. End several roads in unit. Unit on edge of 1000' beach buffer. PCT at 20 years.  |



# Chasina Study Area Interim Layout NOI Unit 678-312

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

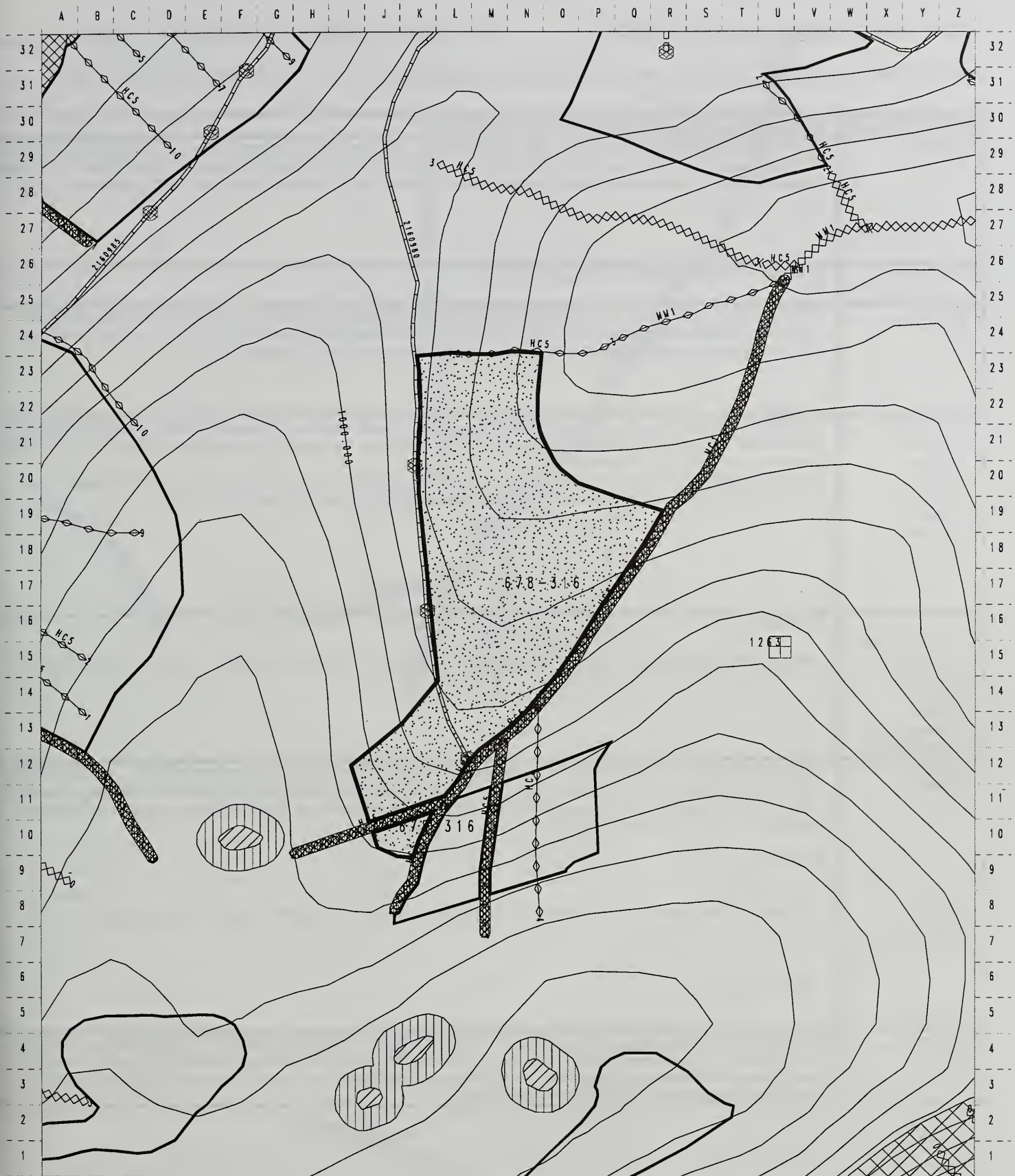
VCU-UNIT#: 678-316      ACRES: 33      VOL: 1188      MBF      ALTERNATIVES: 3,4,5,6

PHOTO YR/#: '91-590-65      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: SL

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67802-015, moderate windthrow risk, mod. to high elev. Productivity of site is high. Verify difficult roads/and/or landing locations. Maintain setting width between units. Small portion of difficult downhill yarding. Dropped 2 acres of cliffs-weather boundary.   |
| J. Oien 5/96   | ROADS: Avoid Karst formations when possible.  |
| R.Johnson<br>6/20/96   | SOILS/WATERSHED: Top portion of unit lies above 1200' elevation on the south end to about 980' on the north end. Partial suspension for karst, forested wetlands, and McGilvery (BMPs 12.5, 13.9; TLMP 1991). Top of the unit can be expanded further to the west. Lower portion of the unit between 910' elevation on the south end to about 830' on the north end, and down to about 640' on the east end. Elevations were measured in the field and may not correspond to those shown on the unit map. Partial suspension for forested wetlands, MMI3, small areas of MMI4 too small to delete, McGilvery, and nonstreams (BMPs 12.5, 13.1, 12.6, 13.5, 13.9, 13.16; TLMP 1997). Additional information is filed in the reconnaissance folder. Unit is in second order watershed EX8A. |
| D. Kuntzsch,<br>M. Solomon,<br>S. Deck,<br>6/20/96                             | FISHERIES: Stream 1 is a class III orange/ white that requires a slope break buffer. Stream 1 is 4 feet wide, has 10 feet of incision, and 43% gradient. Stream 2 is a class III orange/ white that requires a slope break buffer. Stream 2 is 8 feet wide, has 10 feet of incision and 7% gradient. Stream 3 was a class III orange/ white. Under the new TLMP (1997) standards stream 3 is a class IV orange/ white because it is 3 feet wide, has an incision of 3 feet and 3% gradient. Stream 3 is flagged orange/ white to provide additional resource protection.<br>Orange/ white streams require directional falling, split yarding or full suspension, and immediate cleaning of introduced debris (BMP 13.16).   |
| M.Dillman,<br>J.Wrate 6/27/95<br>C.Tighe,<br>B.Johnston, A.<br>Mueller 6/13/96 | WILDLIFE:<br><br>Bear sign seen in area. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/13/96 Deer sign- beds, pellets, and browse seen in unit. Unit also had game trails throughout. Bear scat and dug up skunk cabbage seen. Wolf scat also seen in muskeg. Karst along ridge. Great goshawk habitat.   |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Dropped 2 acres of cliffs - feather boundary. See map. Drop upper road. Delete MMI4 soils. Slackline capabilities may be necessary for soil protection. Helicopter yarding recommended across last creek for stream protection. PCT at 15 years.  |

# Chasina Study Area Interim Layout N01 Unit 678-316

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 678-319      ACRES: 9      VOL: 214      MBF      ALTERNATIVES: 3,4,5,6

PHOTO YR/#: '91-590-64      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67802-012, high windthrow risk, high elev. mod. mistletoe present. Productivity of site is moderate. Unit design calls for clear-cut regeneration method. Potential to add on to the west on flat above units 316 and 319. Dropped top of unit to stay off oversteepen slopes to east and south. Maintain cedar component through seed trees, scarification, and planting.   |
| J. Oien 5/96  | ROADS: Avoid karst formations whenever possible.  |
| R.Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 32E (StNicholas 60-75%). Partial suspension for MMI3 and forested wetlands (BMPs 12.5, 13.9). Field review may be needed during layout for unstable soils and McGilvery (BMPs 13.2, 13.5; TLMP 1997). Additional information is filed in the reconnaissance folder. Unit is in second order watershed EX8A.   |
| K. McCartney,<br>M. Becker,<br>C. Tighe,<br>J. Wrate,<br>D. Kuntzsch,<br>J. Frank,<br>J. Baichtal,<br>6/13/95 | FISHERIES: Stream 1 is a class III orange/ white (see unit 678-316) that requires a slope break buffer. Stream 2 is a class III orange/ white that requires a slope break buffer (BMP 13.16). Stream 4 was a class III green/ white, under the new TLMP (1997) standards stream 4 is a class IV green/ white.<br>The green/ white streams require directional falling, and split yarding (where practical) or partial over. Clean streams of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16). |
| C.Tighe, J. Wrate,<br>M. Becker, K.<br>McCartney<br>6/13/95<br>C.Tighe,<br>B.Johnston, A.<br>Mueller 6/13/96  | WILDLIFE:<br><br>Recommend leaving live reserve trees and snags to maintain habitat structure and snag density. 6/13/96 Deer sign in unit.  |
| J.Baichtal<br>5/15/96<br>10/22/96   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Possibly on Ruby Tuesday Claim Block. Well developed epikarst / sink holes / and small cave along upper unit boundary. The karst portion of the unit is of high vulnerability. The karst portion of the unit should be removed from the unit as per the standards and guidelines outlined in the RSDEIS for the TLMP.<br><br>LANDS:   |
| T.Fifield<br>10/28/96   | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type B clear-cut. Leave less than or equal to 16" cedars on edges of unit. Avoid infected hemlock residuals. Partial YC planting site. PCT at 25 years. Very steep to the south and east. ROAD TO UNIT DELETED.   |

# Chasina Study Area Interim Layout N01 Unit 678-319

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 678-324      ACRES: 10      VOL: 225      MBF      ALTERNATIVES: 3, 4, 6

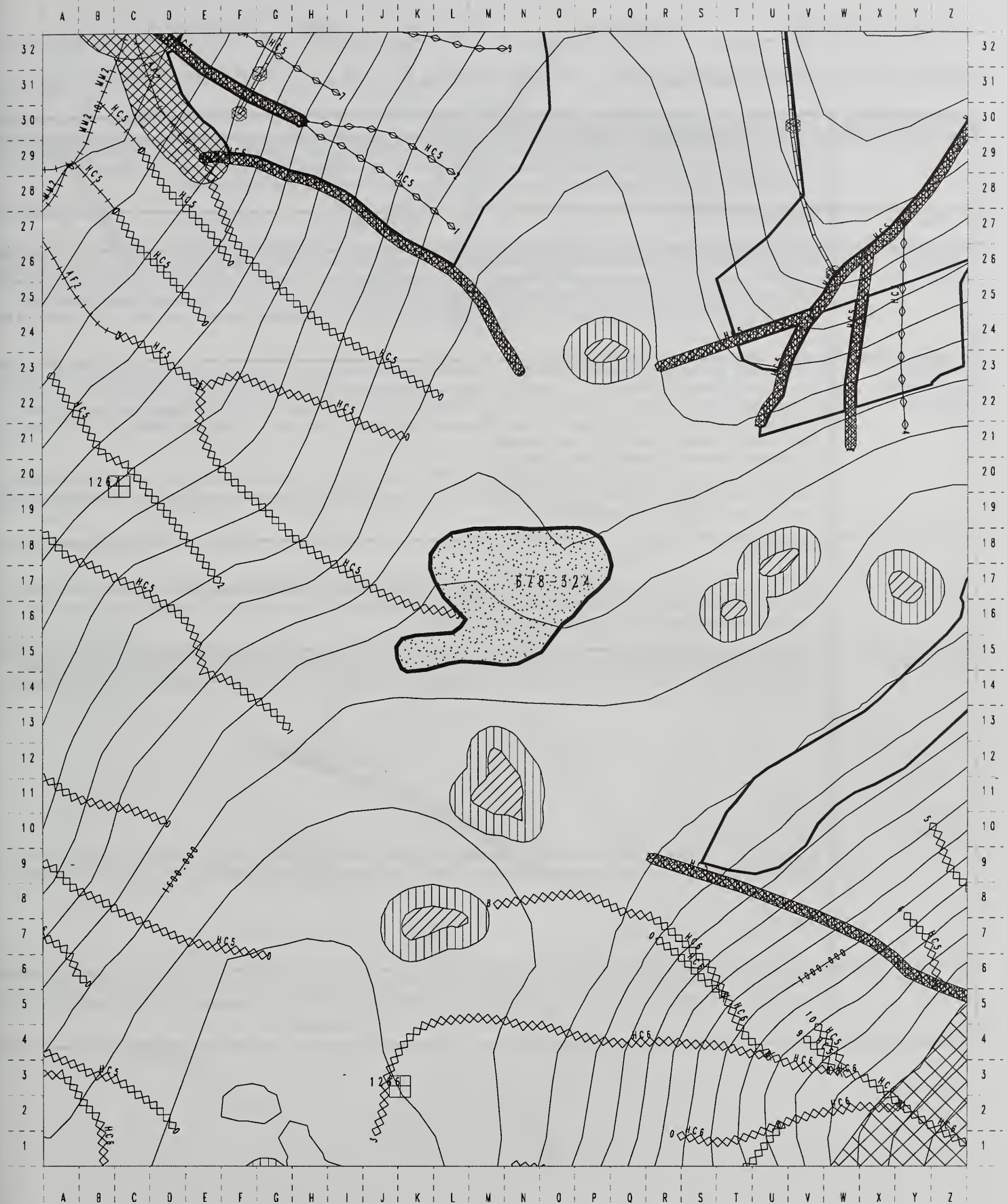
PHOTO YR/#: '91-590-64      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67404-013, low windthrow risk, high elev. Productivity of site is moderate. 2-3 layer canopy, regeneration abundant. Unit extended to the west. Only economical if adjacent units harvested.   |
| J. Oien 5/96   | ROADS: No concerns.   |
| R.Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped as 32 E (StNicholas 60-75%). Partial suspension for MMI3 and forested wetlands (BMPs 12.5, 13.9). Unit is in third order watershed H21A and second order watershed EX8A.  |
| J. Frank, M.<br>Becker, K. Mc-<br>Cartney, D.<br>Kuntzsch, J. Ba-<br>ichtal, C. Tighe, J.<br>Wrate, 6/13/95      | FISHERIES: This unit has no fisheries concerns.   |
| C.Tighe, J.Wrate<br>D. Kuntzsch, J.<br>Frank, M. Becker<br>6/13/95 C.Tighe,<br>B.Johnston, A.<br>Mueller 6/13/96 | WILDLIFE:<br><br>Few snags. Trees spaced out. Deer sign and browse rare. Recommend leaving live reserve trees and snags to maintain habitat structure and snag density.   |
| J.Biachtal   | GEOLOGY/MINERALS: Unit visited by Forest Geologist. No known geology, minerals or karst resource concerns.  |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97  | PRESCRIPTION: Even-aged shelterwood. Leave/reserve trees are 3 trees/acre preferably of cedar and spruce. They can be interspersed in clumps or along the perimeter(due to the small size of the unit. Overstory removal. Leave all unmerchantable trees standing where feasible and safe. . Partial suspension required for soils protection. Windthrow risk less than unit 325. Monitor high elevation regeneration difficulties. No PCT anticipated. Helicopter landing options to water or end of road. |



# Chasina Study Area Interim Layout NOI Unit 678-324

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



## CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 678-325 ACRES: 17 VOL: 310 MBF ALTERNATIVES: 3, 4, 6

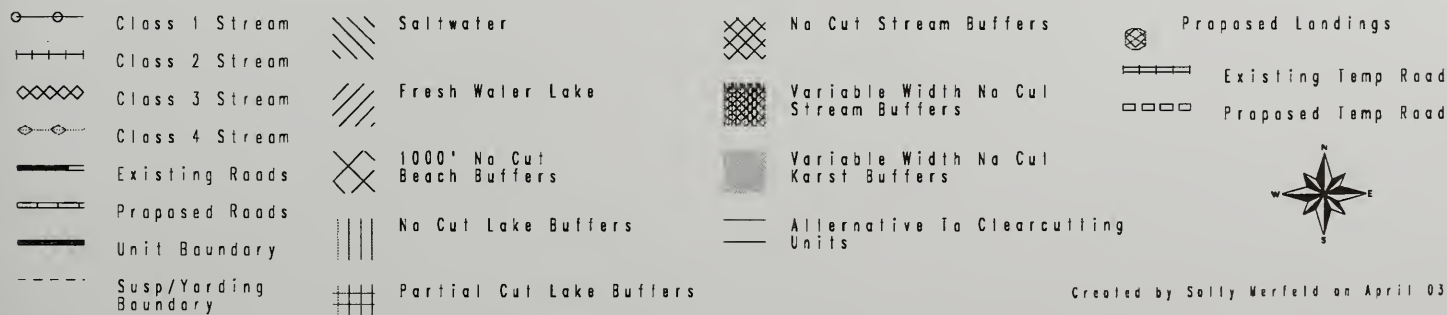
PHOTO YR/#: '91-590-63/'72(44)-772-160 1/4 QUAD: CRG A-1 NW 1/4 LOGGING SYSTEMS: HE

[illegible]



# Chosina Study Area Interim Layout NO1 Unit 678-325

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

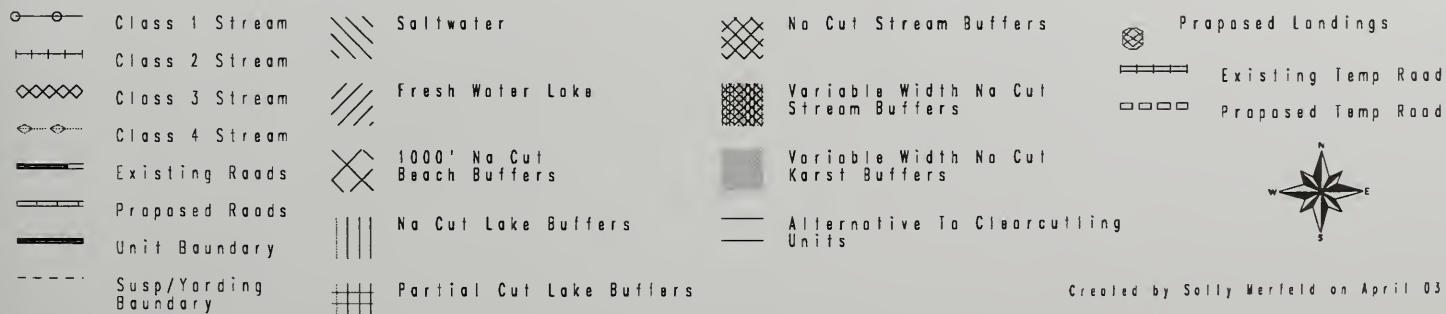
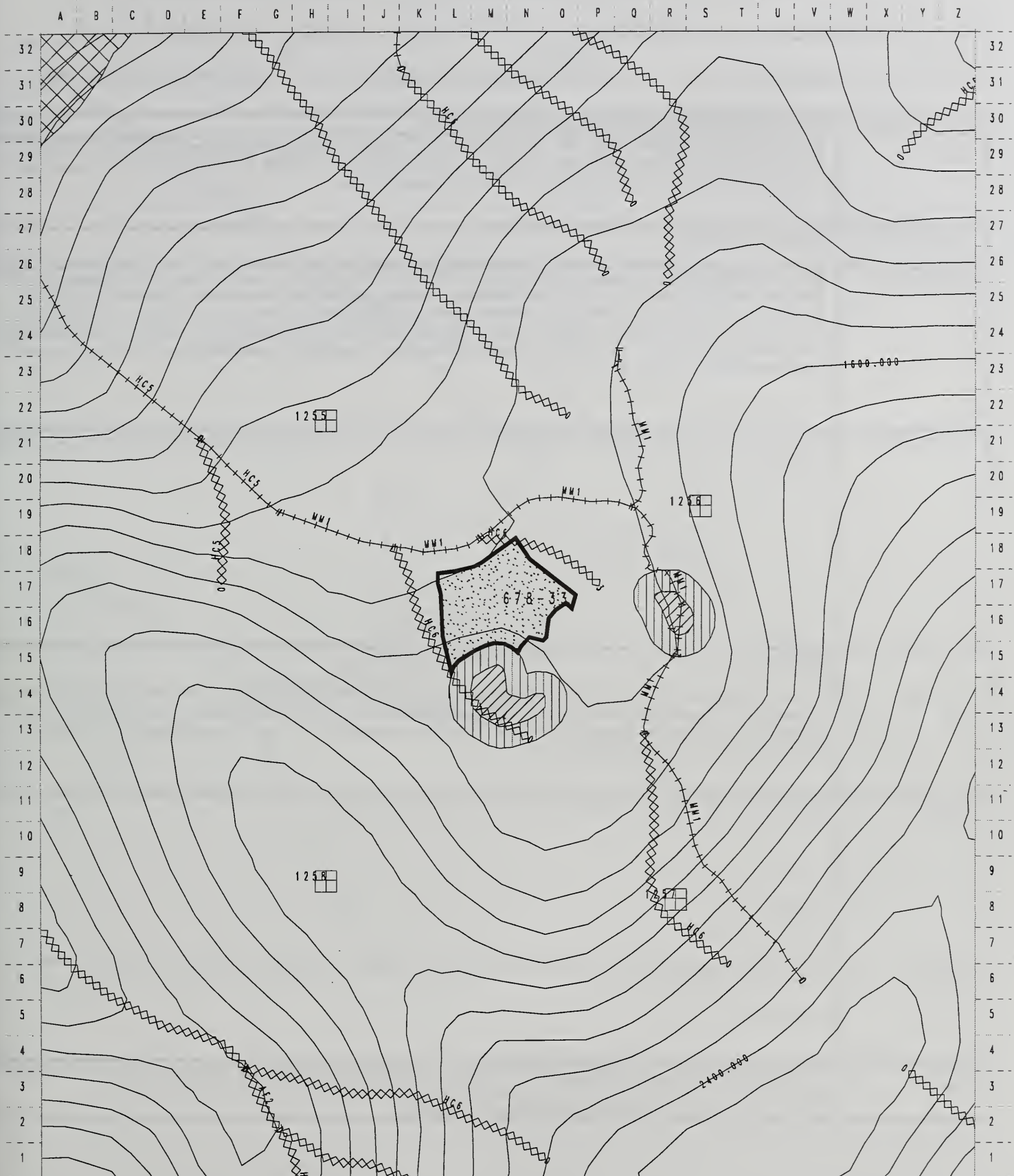
VCU-UNIT#: 678-331 ACRES: 5 VOL: 113 MBF ALTERNATIVES: 6

PHOTO YR/#: '91-590-24 1/4 QUAD: CGRG A-1 NW 1/4 LOGGING SYSTEMS: HE

| REVIEWER&DATE         | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|-----------------------|---|
| G.Lawton<br>12/97     | SILVICULTURE/TIMBER: 67801-071, low windthrow risk, high elev. Productivity of site is high. Adjacent to private clear-cutting. Defer until adjacent cuts have grown into poles with canopy closure. 95% hemlock composition. Avoid PCT due to minor financial return in hemlock.   |
| J. Oien 5/96          | ROADS: No concerns.   |
| R.Johnson<br>6/96     | SOILS/WATERSHED: Soils mapped 528E (Tolstoi - McGilvery 60-75%). Partial suspension for MMI3, and McGilvery (BMP 13.9; TLMP 1997); helicopter prescribed. SW corner deleted for unstable, disturbed, MMI 4 soils (BMP 13.5). May need protection lake SW corner and stream leaving lake (BMPs 12.6, 12.6a, 13.16). May need field review during layout for deletion of additional unsuitable lands on the west boundary (BMPs 13.2, 13.5; TLMP 1997).   |
| K. Buckley 7/96       | FISHERIES: Office review identified that lake needs a 100' no cut buffer (BMP 12.6).  |
| M.Dillman<br>7/96     | WILDLIFE:<br><br>To provide for adequate snag density and distribution within the VCU, recommend leaving a 0.1 acre or larger snag patch for each 10 acres of unit. Recommend leaving live reserve trees where possible to maintain habitat structure. This unit did not rate as a high priority area for wildlife because its elevation is above that recommended in the current goshawk protocol. Therefore, wildlife did not survey in 1995 or 1996. |
| J.Baichtal            | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96 | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97     | PRESCRIPTION: Isolated stand. Very low priority to cut. Clearcut only economical option. Use clearcut Type A.   |

# Chasino Study Area Interim Layout NOI Unit 678-331

Mapscale 1:7920 (8 inch to Mile)



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 678-334      ACRES: 17      VOL: 340      MBF      ALTERNATIVES: 6

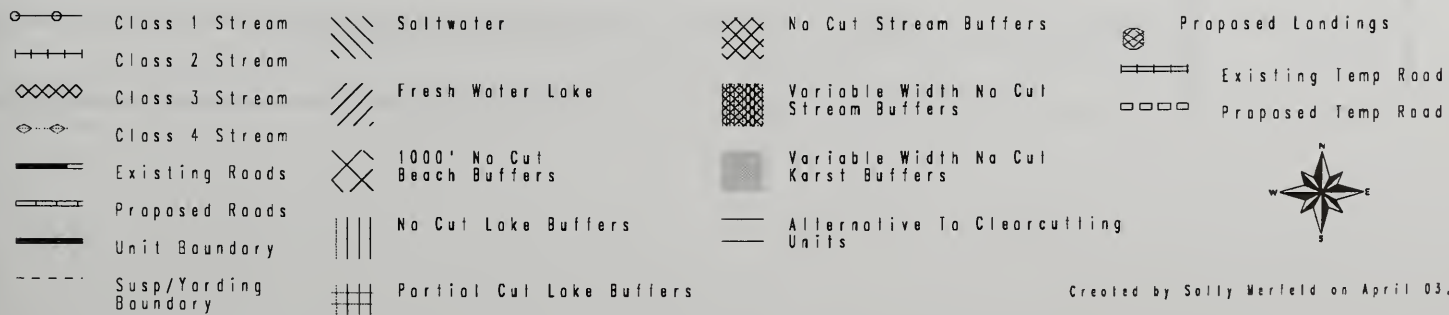
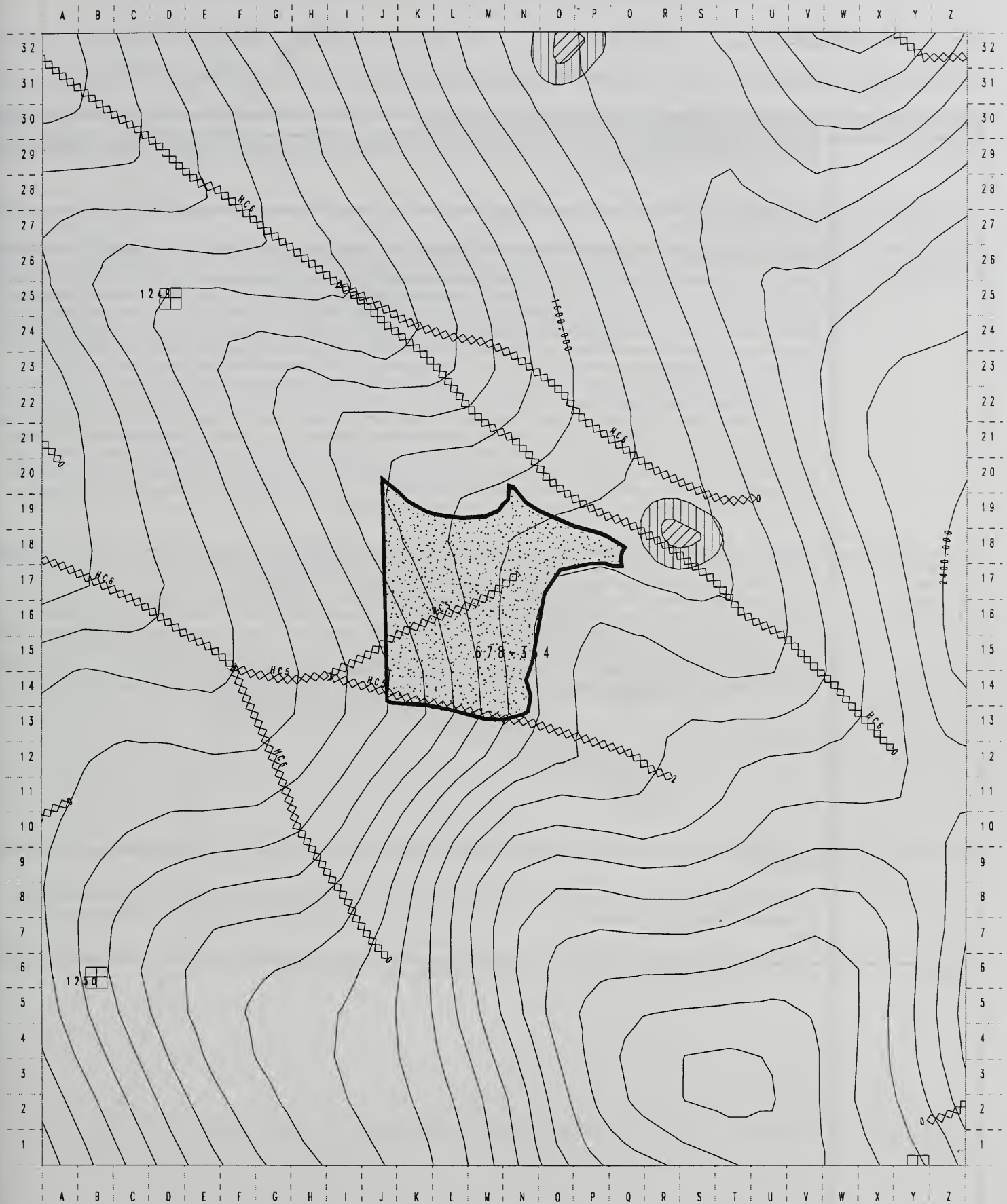
PHOTO YR/#: 91-590-26      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE         | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|-----------------------|--|
| G.Lawton<br>12/97     | SILVICULTURE/TIMBER: 67801-056, high windthrow risk, high elev., high mistletoe present. Productivity of site is low. Adjacent to private clear-cuts. Short trees, high defect. Lake on photo is actually rock. Drop scrub at top of unit, avoid steep dropoff to north and convex slope to the west. Defer for adjacency greenup.   |
| J. Oien 5/96          | ROADS: No concerns.  |
| R.Johnson<br>6/96     | SOILS/WATERSHED: Soils mapped 528D (Tolstoi - McGilvery 35-60%), appears steeper on photos. <u>Partial suspension</u> for MMI3 and McGilvery (BMP 13.9; TLMP 1997); helicopter yarding prescribed. May need to bring E boundary down slope to exclude disturbed, MMI4 soils (BMP 13.5). Probably slope break buffer S boundary stream, since it appears unstable (BMPs 13.16, 13.5). Potential to expand downslope. Most in third order watershed H27A which will have about 63% cumulative effect under alternative 6 (BMP 12.1; TLMP 1997). May need field review during layout for unsuitable lands on the north and south boundaries (BMPs 13.2, 13.5; TLMP 1997). |
| K.Buckley 8/96        | FISHERIES: Office review determined possibility of streams in unit needing protection. Stream protection measures will be identified during unit layout.   |
| M.Dillman<br>7/96     | WILDLIFE:<br><br>To provide for adequate snag density and distribution within the VCU, recommend leaving a 0.1 acre or larger snag patch for each 10 acres of unit. Recommend leaving live reserve trees where possible to maintain habitat structure. This unit did not rate as a high priority area for wildlife because its elevation is above that recommended in the current goshawk protocol. Therefore, wildlife did not survey in 1995 or 1996.  |
| J.Baichtal            | GEOLOGY/MINERALS: No geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96 | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97     | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut. Defer for better and future economics and greenup on private land.   |



# Chasina Study Area Interim Layout NOI Unit 678-334

Mapscale 1:7920 (8 inch to Mile)



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 678-339      ACRES: 14      VOL: 560      MBF      ALTERNATIVES: 6

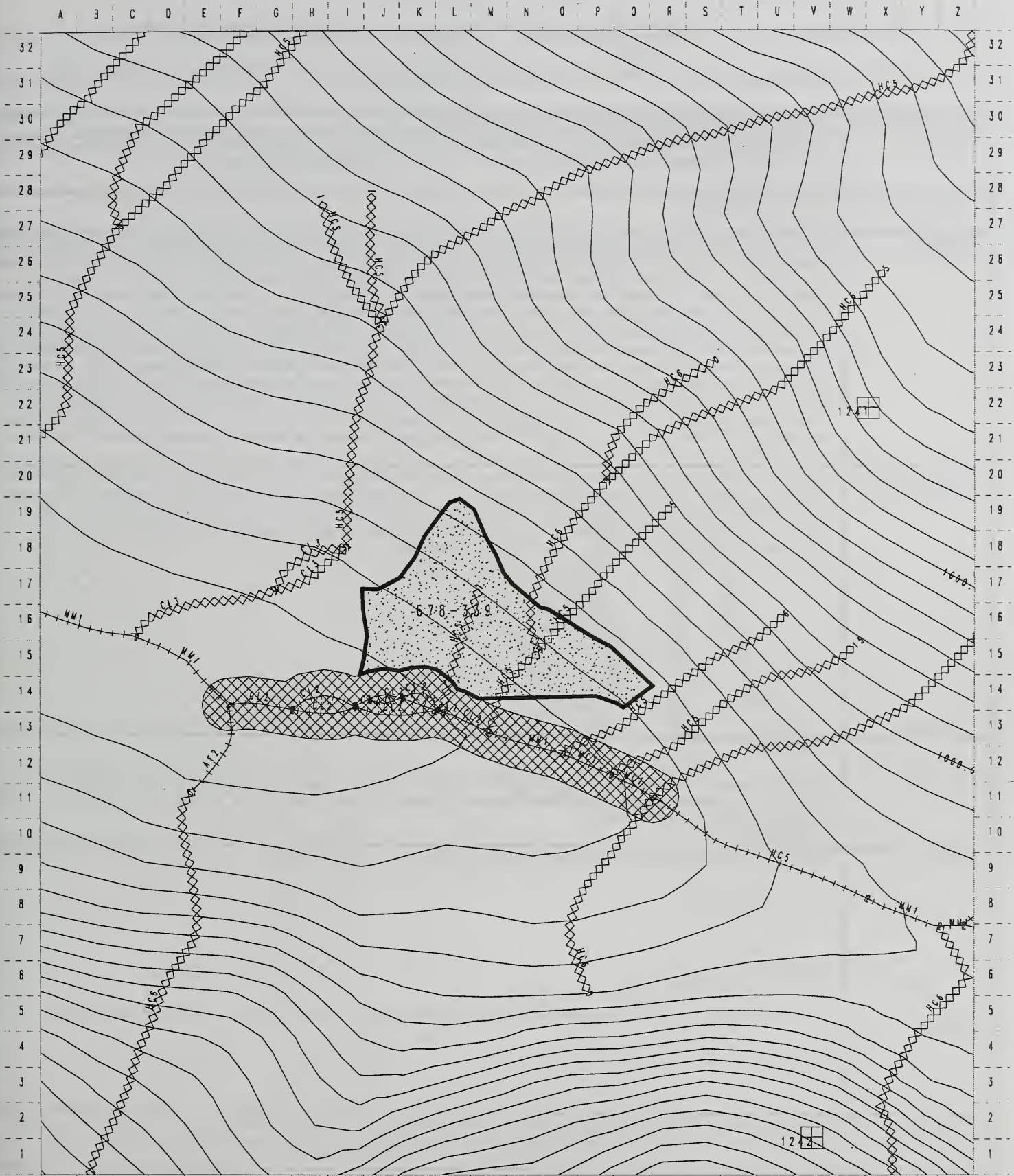
PHOTO YR #: '91-590-27      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                                       | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                                   | SILVICULTURE/TIMBER: 67801-033, high windthrow risk. Productivity of site is high. Partial cut buffer. Adjacent to private clear-cuts. Very unstable area.  |
| J. Oien 5/96  | ROADS: No concerns.   |
| R.Johnson<br>9/12&13/95                             | SOILS/WATERSHED: Soils primarily Tolstoi and McGilvery, with lithic Shakan, Kitkun, in remaining portion of unit. Slopes less than 70%, generally highest upper backline, and decreasing downslope. <u>Partial suspension</u> for MMI3, McGilvery, and numerous small drainages (BMPs 13.9, 13.16; TLMP 1997). Helicopter yarding prescribed. Deleted W portion S from where stream on unit card changes from N to S direction to SW direction, to avoid riparian (BMP 12.6). Deleted E portion from second stream from E shown on unit card, which point unit changes from S to SW aspect, to avoid unstable forested wetland (BMPs 12.5, 13.5). Lower boundary above riparian on creek on S, swings to N at middle creek shown on unit card to exclude alders and shrubs. Upper boundary extended upslope to break where slopes increase above 65-70%. Slopes above much steeper and unstable (BMP 13.5). Twelve drainages in unit includes seeps. Most drainages from slides and snow avalanches above, most dry or minimal flow, alders and salmonberry common along channels. Green and white for drainage #6 (#7 in fisheries)(west of slide channel #8, #5 in fisheries, shown on unit card in center of unit) and #13(#6 in fisheries) on new east boundary (BMP 13.16). Fish has bottom of soils creek #13, (#6 in fisheries) as O&W. Other soils drainages are classified as non-streams. Deleted west piece S of main creek because riparian and MMI4 on steep slopes (BMPs 12.6, 13.5). Believe E piece S of main creek acceptable as above riparian: break upper boundary slopes >72% for MMI4 and McGilvery (BMP 13.5; TLMP 1997). Third order watershed H28A will have about 9% cumulative effect under alternative 6 per GIS (BMP 12.1; TLMP 1997). This value is suspected of being to low due to the amount of harvest on Private lands. Defer harvest on Kitkun soils (TLMP 1997). |
| D.Kuntzsch,<br>J. Frank<br>R. Johnson<br>9/12-13/95 | FISHERIES: Stream 1 is a Class III orange/ white. Stream 2 is a class II orange/ white AHMU that requires a 120' buffer (BMP 12.6). Stream 3 and 4 are side channels of stream 2 and require a 120' AHMU buffers (BMP 12.6). Stream 5 (stream 8 in soils report) is a class III green/ white. Stream 6 (stream 13 in soils report) is a class III orange/ white at the bottom of the unit, and changes to class III green/ white near the top of the unit. Stream 7 is a class III green/ white. Stream 15 (from soils report) is a class III green/ white. Refer to soils report for additional water quality streams and a class III green/stream west of stream 5. The orange/ white streams require directional falling, and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating period or before the yarder leaves the area (BMP13.16).   |
| M.Dillman<br>7/96                                   | WILDLIFE:<br><br>Wildlife recommends leaving live reserve trees and snags to maintain habitat structure and snag density. This unit exceeds the steepness and elevation criteria recommended by the current goshawk protocol so it was no surveyed by wildlife during 1995 or 1996.   |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96                               | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                                   | PRESCRIPTION: Use type C clear-cut. Overstory removal; leave all species less than 16" DBH.   |



# Chosina Study Area Interim Layout NOI Unit 678-339

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





## CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

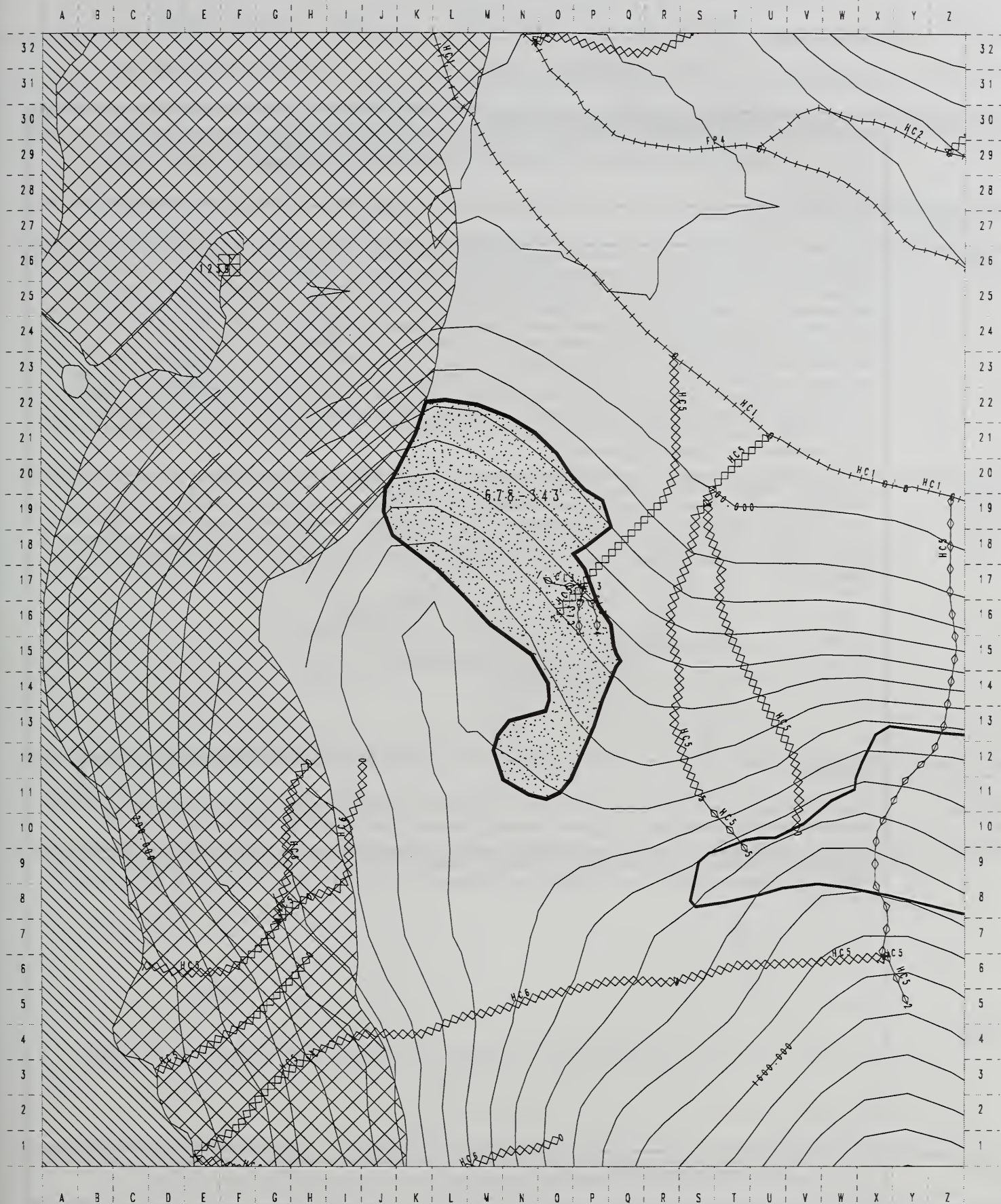
VCU-UNIT#: 678-343 ACRES: 24 VOL: 360 MBF ALTERNATIVES: 6

PHOTO YR/#: '91-590-58      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                     | RESOURCE CONSIDERATIONS/CONSIDERATIONS   |
|-----------------------------------|--|
| G.Lawton<br>12/97                 | SILVICULTURE/TIMBER: 67801-013. high windthrow risk. Multistoried. Productivity of site is low. Avoid steep areas to the north and west (see soils). Moderately high elevation. Plant YC for maintenance of YC composition.  |
| J. Oien 5/96                      | ROADS: No concerns.  |
| R.Johnson<br>9/15/95              | SOILS/WATERSHED: West, upper boundary is top of sideslope where breaks to flattish top at about 850'. Top relatively flat but muskeg and low volume forest wetland (Kaikli, Kina) not part of unit (BMP 12.5; TLMP 1997). Sideslope is unit, continues down to second growth. Soils Tolstoi, Traitors, with McGilvery. Slopes 50-90%. Partial suspension due to MMI3 and McGilvery (BMP 13.9; TLMP 1997). Helicopter prescribed. Areas steeper slopes (about 90%) from midslope to near bottom unit. Concerns because trees are pedestaled, pistol butted, leaning, and blowdown was observed; believe trees unstable due to wind rather than soil unstable. Believe possible expand unit to N and E on sideslope. S end unit changes to forest wetland (StNicholas). Has numerous small V-notches (approx. 10' deep) from top of unit, which combine into main V's. All V-notches orange and white class III because unstable side slopes, even though some dry (BMP 13.16). Not believe able provide O&W protection due closeness of streams. SW boundary junction N-S ridge on W, and rock face to S, and all lands N aspect downslope from rock face. Exclude all lands in N facing bowl between two units due to unstable MMI 4, colluvial McGilvery, numerous drainages, landslides, and disturbed ground (BMPs 13.5, 13.16; TLMP 1997). Third order watershed H28A will have about 9% cumulative effect under alternative 6 per GIS (BMP 12.1; TLMP 1997). This value is suspected of being to low due to the amount of harvest on Private lands. |
| K. McCartney, M. Solomon, 6/13/96 | FISHERIES: Stream 1, 2, 3 and 4 are class III orange/ white due to the instability of the stream banks. Stream 5 is a class III orange/ white that turns into a class IV green/ white at 1120' of elevation. Karst is present in the unit. The orange/ white streams require directional falling, and split yarding or full suspension, and cleaning of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial over. Clean streams of introduced debris before the end of the season or before the yarder leaves the area (BMP 13.16).  |
| M.Dillman<br>7/96                 | WILDLIFE:<br><br>Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This unit exceeds the steepness recommended by the current goshawk protocol so was not surveyed by wildlife during 1995 or 1996. Maintain 1000 foot buffer along shoreline.   |
| J.Baichtal                        | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96             | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                 | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut.  |

# Chosina Study Area Interim Layout NOI Unit 678-343

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 678-344      ACRES: 21      VOL: 525      MBF      ALTERNATIVES: 6

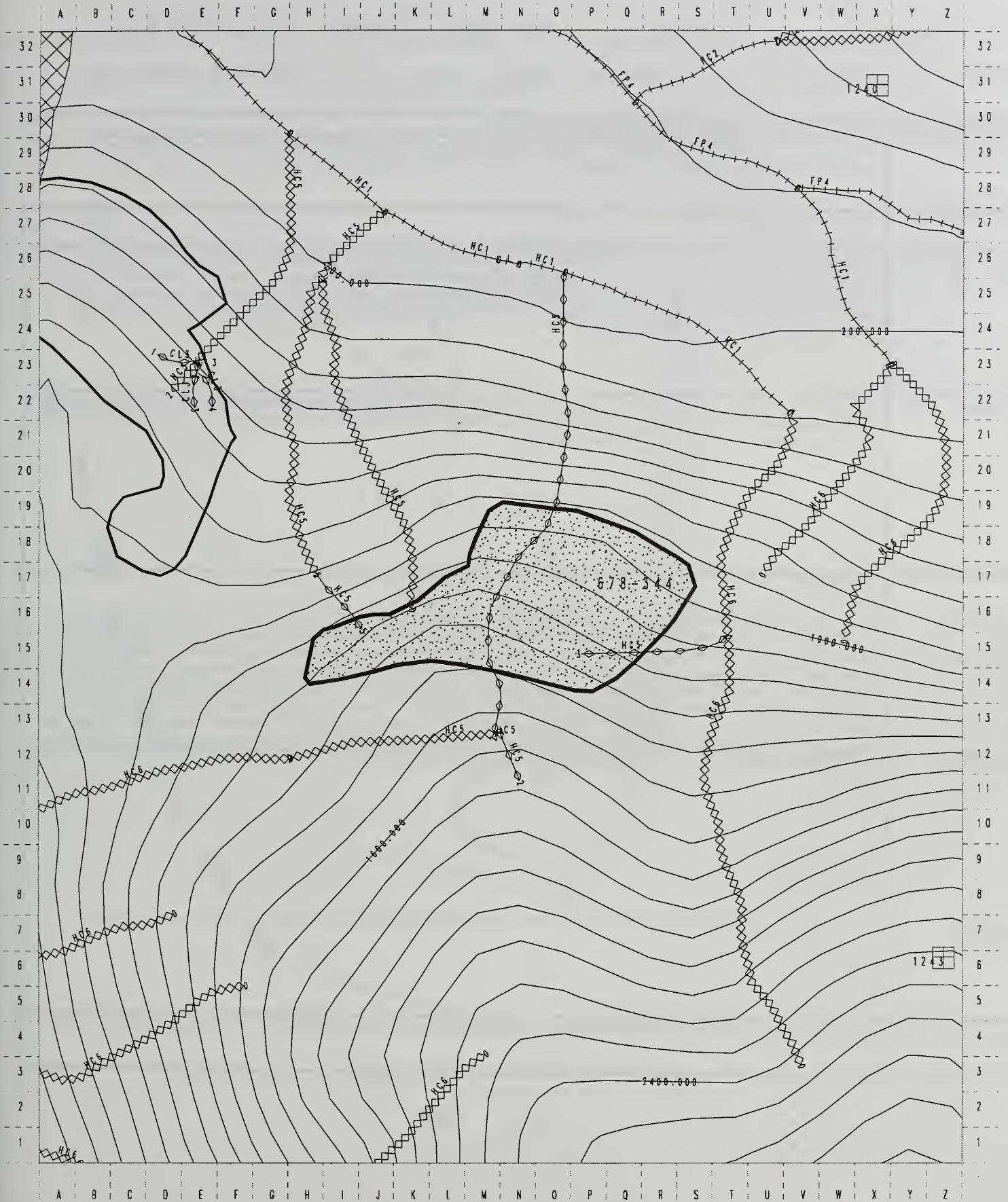
PHOTO YR/#: '91-590-58      1/4 QUAD: CRG A-1 NW 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                                     | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                                 | SILVICULTURE/TIMBER: 67801-007, 67801-008, high windthrow risk, high elev. Productivity of site is moderate. Soils changed original shape to avoid unstable steep slopes to south and expanded unit to west and north. Helicopter yarding distance 3/4 mile.  |
| J. Oien 5/96                                      | ROADS: No concerns.   |
| R.Johnson<br>9/15/95                              | SOILS/WATERSHED: W boundary is slope break above rock faces that are above landslide on east side of N facing bowl between units. N boundary continues above rock wall, which is above second growth. E boundary at slope break where drops E to drainage flowing S. Slope break buffer on this class III due unstable MMI4 soils (BMPs 13.5, 13.16). E boundary continues S to rock knob at 1160', which is SE corner. Keep below knob and then diagonal to ridge about 1400', cross ridge heading W, then S to approx. 900' above slide, which is NW corner where started. Soils Tolstoi, StNicholas, McGilvery, Kitkun, Traitors, with To-keen, shallow Shakan. Slopes 45-110%. Steeper slopes (>75%) associated with rock faces primarily in NW portion of unit. Full suspension prescribed by helicopter yarding should protect MMI3, inclusions MMI4, forested wetlands, McGilvery mixed throughout unit (BMPs 12.5, 13.5, 13.9; TLMP 1997). Still, marginal unit due amount McGilvery, rock faces, inclusions MMI4, and unstable. Maybe two O&W class III small v-notches that are continuation of creeks on west side of unit on unit card (BMP 13.16). Several lesser drainages G&W class IV, small v-notches, and non-flag drainages (BMP 13.16). Third order watershed H28A will have about 9% cumulative effect under alternative 6 per GIS (BMP 12.1; TLMP 1997). This value is suspected to be low due to the amount of harvest on Private lands. |
| K. Kitchel,<br>K. Buckley,<br>S. Deck,<br>6/13/96 | FISHERIES: Stream 2 is a class III orange/ white that changes to a class IV green/ white at 1280' of elevation. Stream 3 is a class IV green/ white. Stream 4 is a class III orange/ white; at 1220' of elevation stream 4 becomes a class IV green/ white. This unit is very steep. The class III orange/ white streams require directional falling, split yarding or full suspension, and immediate removal of introduced debris (BMP 13.16). The class IV green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris before the end of the season or before the yarder leaves the area (BMP 13.16).  |
| M.Dillman<br>7/96                                 | WILDLIFE:<br><br>Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This unit exceeds the steepness recommended by the current goshawk protocol so was not surveyed by wildlife during 1995 or 1996.   |
| T.Fifield<br>10/28/96                             | GEOLOGY/MINERALS: Unit was not visited by the Forest Geologist. No karst resources described by other resource specialists. Carbonate is mapped within the unit on the geologic map. If present, it is most likely of moderate vulnerability. Partial suspension is required.<br><br>LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                                 | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut.   |



# Chasina Study Area Interim Layout NOI Unit 678-344

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 678-375      ACRES: 36      VOL: 1440      MBF      ALTERNATIVES: 6

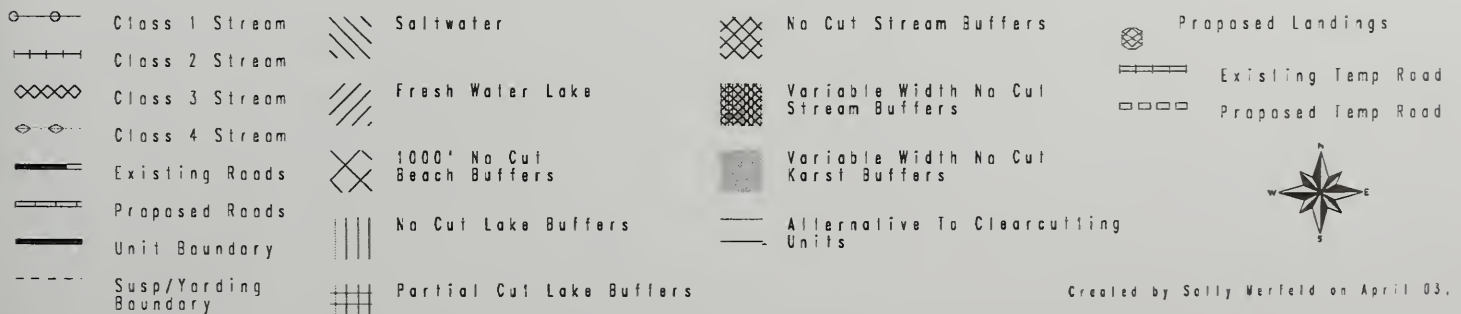
PHOTO YR/#: '91-390-103      1/4 QUAD: CRG A-2 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                           | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97                       | SILVICULTURE/TIMBER: 67802-031, 67802-019. high windthrow risk, high elev. Productivity of site is high. Partial cut buffer. Avoid oversteepen slopes. Originally in HCA until TLMP revised. No field visit.   |
| J. Oien 5/96                            | ROADS: No concerns.  |
| R.Johnson<br>6/96                       | SOILS/WATERSHED: Soils mapped 528D (Tolstoi - McGilvery 35-60%). Partial suspension for McGilvery (TLMP 1997). Helicopter logging prescribed (BMP 13.9). W boundary at steeper lands which MMI4 and McGilvery. V-notches located in N, E center, and E parts of the unit may require slope break buffers, diameter limit cuts, or be unit boundaries on slope breaks as applicable (BMP 13.16). Cliff should be S boundary. Field review needed during layout for unsuitable lands on west and south boundaries (BMPs 13.2, 13.5; TLMP 1997).  |
| D.Kuntzsch, 7/96                        | FISHERIES: Protect water quality streams in unit per soils instructions. GIS has a class II AHMU stream as the east unit boundary. This stream will need to be field verified by a fisheries biologist during layout, but should be given a 100' no-cut buffer for planning purposes.  |
| M.Dillman<br>7/96<br>M.Dillman<br>12/97 | WILDLIFE:<br><br>This unit is within an old growth reserve. Wildlife did not survey in 1995 or 1996. If current policy is changed and this unit is harvested wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Also, if this unit is harvested wildlife will need to conduct surveys in the area prior to harvest. Unit is within 1.2 mile of a known eagle nest. If the unit is harvested all road construction must be accomplished in accordance with the requirements of the Bald Eagle Protection Act, and must also comply with the MOU between the Forest Service and the U.S. Fish and Wildlife Service. Written coordination with the USF&WS must be documented. If unit is helicoptered location of eagle nest may effect fly drop zones. 12/97- This unit is now in alternative 6. As stated wildlife did not survey this unit, nor is there any intention of surveying this unit. If anything pertaining to wildlife is found during unit layout all current (TLMP 1997) standards and guidelines will be met. |
| J.Baichtal                              | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                       | PRESCRIPTION: Overstory removal by helicopter. Retain spruce and cedar elss than 18" DBH. Retain cedar seed trees on perimeter.  |



# Chasing Study Area Interim Layout NOI Unit 678-375

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

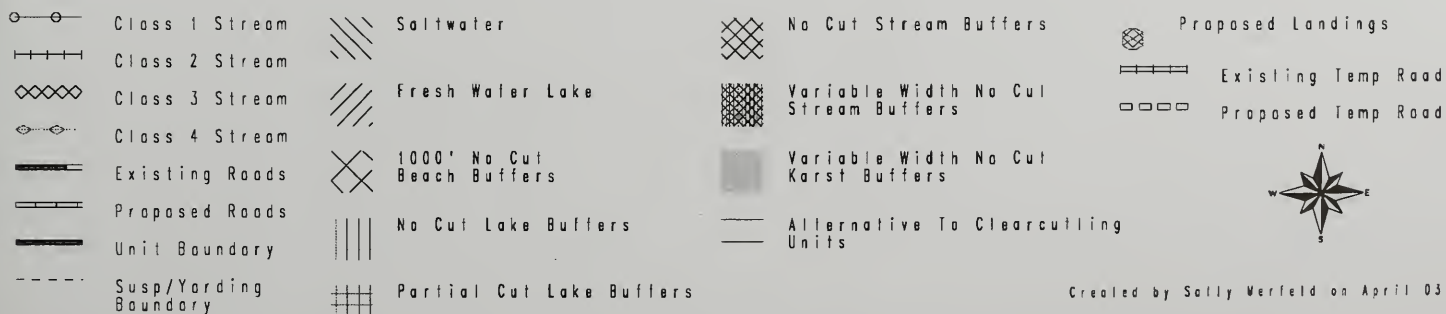
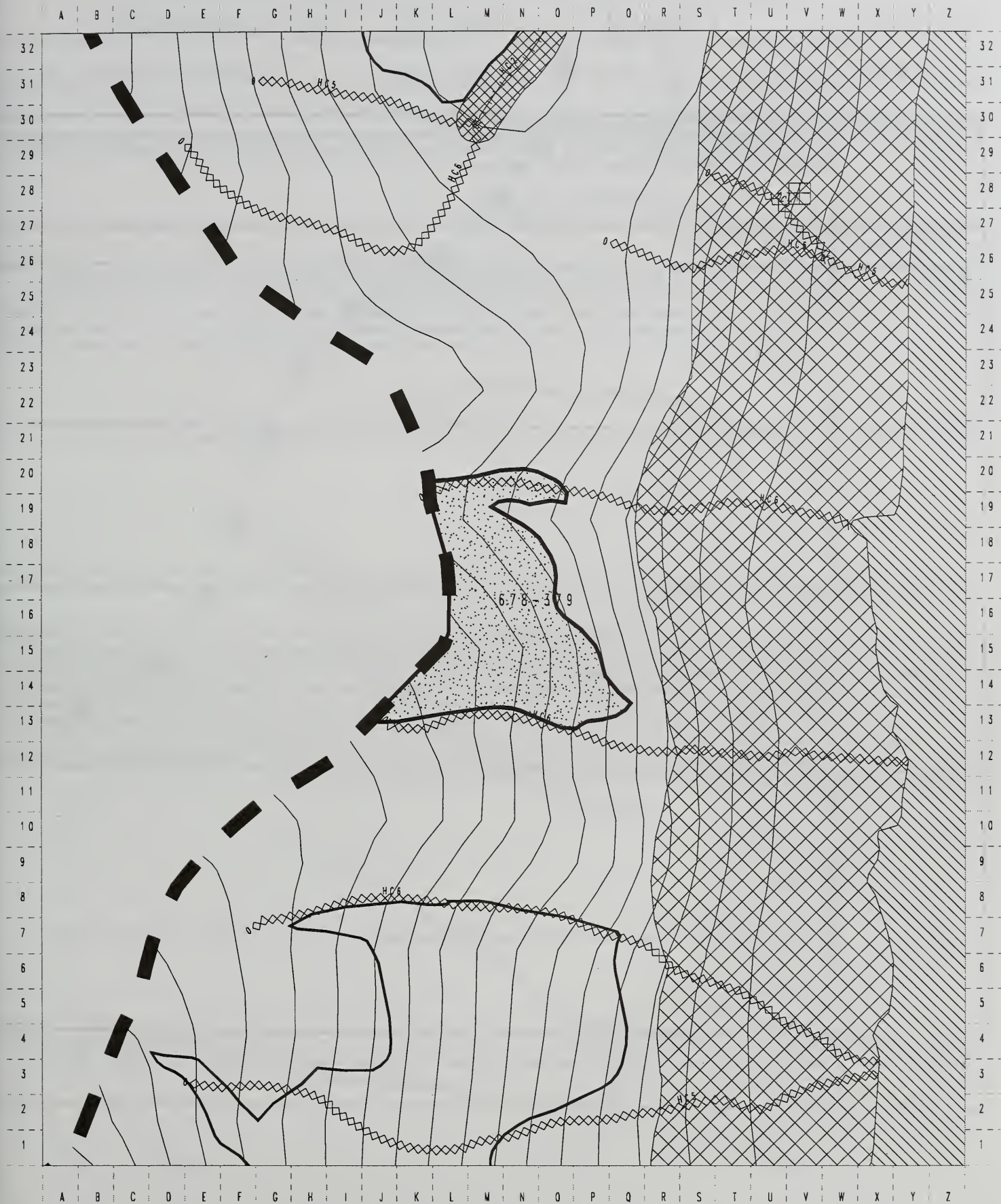
VCU-UNIT#: 678-379      ACRES: 16      VOL: 640      MBF      ALTERNATIVES: 6

PHOTO YR/#: '91-390-104      1/4 QUAD: CRG A-2 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                           | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97                       | SILVICULTURE/TIMBER: 67802-015, high windthrow risk. Productivity of site is high. Use streams for unit boundaries. Avoid oversteepen slopes. Originally in HCA until TLMP revised. No field visit.  |
| J. Oien 5/96                            | ROADS: No concerns.  |
| R.Johnson<br>6/96                       | SOILS/WATERSHED: Soils mapped 528D (Tolstoi - McGilvery 35-60%), 528E (Tolstoi - McGilvery 60-75%), 1D (Vixen 35-60%). Most MMI3 and McGilvery, requires partial suspension (BMP 13.9; TLMP 1997). Helicopter yarding prescribed. May be more steep than mapped based on review of photos. V-notches in E half of the N and S boundaries may require slope break buffers (BMP 13.16). Lake to W may require buffer if unit expanded to west (BMPs 12.6, 12.6a). Field review needed during layout if unit is expanded upslope on to steeper lands that have now been deleted (BMP 13.5).   |
| K. Buckley 7/96                         | FISHERIES: GIS identifies two class III streams. Possibly additional streams present in unit. Stream protection measures will be identified during unit layout.  |
| M.Dillman<br>7/96<br>M.Dillman<br>12/97 | WILDLIFE:<br><br>This unit is within an old growth reserve. Wildlife did not survey in 1995 or 1996. If current policy changes and this unit is harvested wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Also, if this unit is harvested, wildlife will need to conduct surveys in the area prior to harvest. Unit is within a 1/2 mile of a known eagle nest. Road construction must be accomplished in accordance with the requirements of the Bald Eagle Protection Act, and must comply with the MOU between the Forest Service and the U.S. Fish and Wildlife Service. Written coordination with the U.S. F.&W.S. must be documented. If the unit is helicoptered the location of the eagle nest may effect fly/drop zones. 12 97- This unit is now back in the unit pool and in alternative 6. As stated wildlife has not and has no intention of surveying this unit. If anything pertaining to wildlife is found in unit layout all current (TLMP 1997) standards and guidelines will be met. |
| J.Baichtal                              | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                       | PRESCRIPTION: Overstory removal by helicopter. Retain spruce and cedar less than 18" DBH. Retain cedar seed trees on perimeter.  |

# Chasina Study Area Interim Layout NOI Unit 678-379

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 678-381      ACRES: 48      VOL: 1920      MBF      ALTERNATIVES: 6

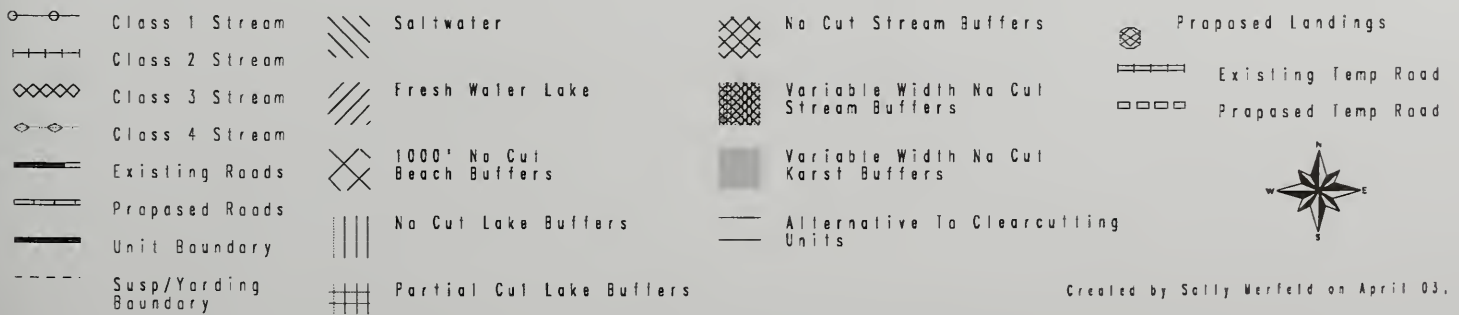
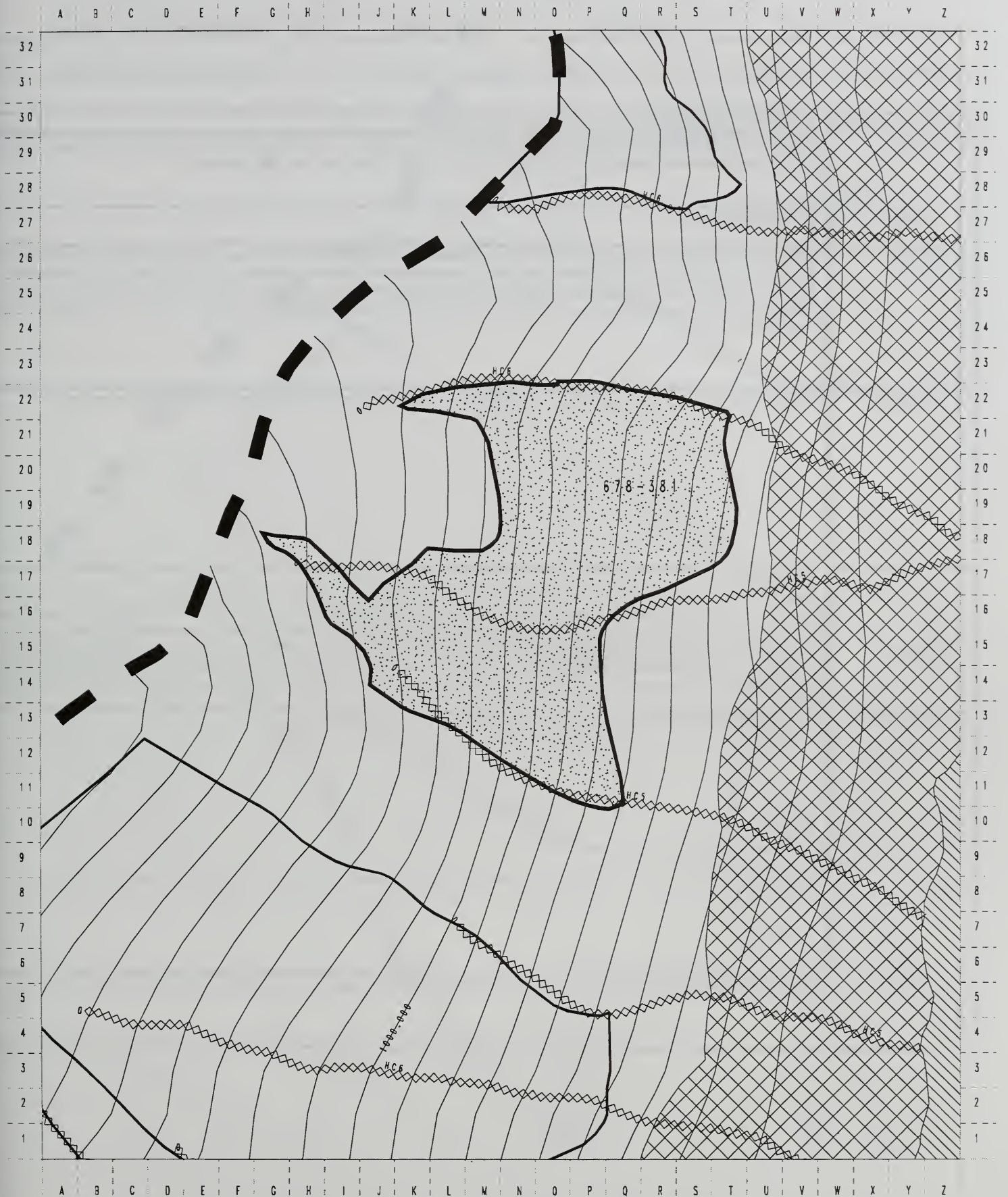
PHOTO YR/#: '91-390-105      1/4 QUAD: CRG A-2 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                           | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                       | SILVICULTURE/TIMBER: 67802-010. High windthrow risk. Productivity of site is high. Avoid oversteepen slopes. Originally in HCA until TLMP revised. No field inspection.   |
| J. Oien 5/96                            | ROADS: No concerns.   |
| R.Johnson<br>6/96                       | SOILS/WATERSHED: Soils mapped 528D (Tolstoi - McGilvery 35-60%), with 1F (Vixen 75-100%), 33D (St. Nicholas - McGilvery 35-60%). Partial suspension for MM13, McGilvery, forested wetlands (BMPs 12.5, 13.9; TLMP 1997). Helicopter prescribed. May be steeper than mapped based review photos. W boundary very steep, MM14, and McGilvery present. Probable O&W protection or slope break buffers streams N and S boundaries, and center of unit (BMP 13.16). Could be diameter limit cut in V-notch below slope break center of unit. Field review needed during layout for slopes >72% and unsuitable lands on the west boundary (BMP 13.5).   |
| D.Kuntzsch, 7/96                        | FISHERIES: Protect water quality streams in unit per soils instructions. No other fisheries concern known at this time.   |
| M.Dillman<br>7/96<br>M.Dillman<br>12/97 | WILDLIFE:<br><br>This unit is within an old growth reserve. Wildlife did not survey this unit in either 1995 or 1996. If current policy is changed and this unit is harvested wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Also, if this unit is harvested, wildlife will need to conduct surveys in the area prior to harvest. Unit is within 1 2 mile of a known eagle nest. Road construction must be accomplished in accordance with the requirements of the Bald Eagle Protection Act and must also comply with the MOU between the Forest Service and the US Fish and Wildlife Service. Written coordination with the USF&WS must be documented. If this unit is helicoptered the location of the nest may effect fly drop zones. 12/97- This unit is now part of the unit pool and in alternative 6. As stated wildlife has not and has no intention of surveying this unit. If anything pertaining to wildlife is found during unit layout all current (TLMP 1997) standards and guidelines will be met. |
| J.Baichtal                              | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96                   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                       | PRESCRIPTION: Overstory removal. Protect/leave all spruce and cedar less than 16" DBH for protection and propagation of cedar at high elevation. Leave cedar seed trees on perimeter. Harvest above approximately 1460' only - <u>see map</u> . Helicopter landing options to road or water.  |



# Chasina Study Area Interim Layout N01 Unit 678-381

Mapscale 1:7920 (8 inch to Mile)



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 678-383 ACRES: 96 VOL: 2400 MBF ALTERNATIVES: 4,5,6

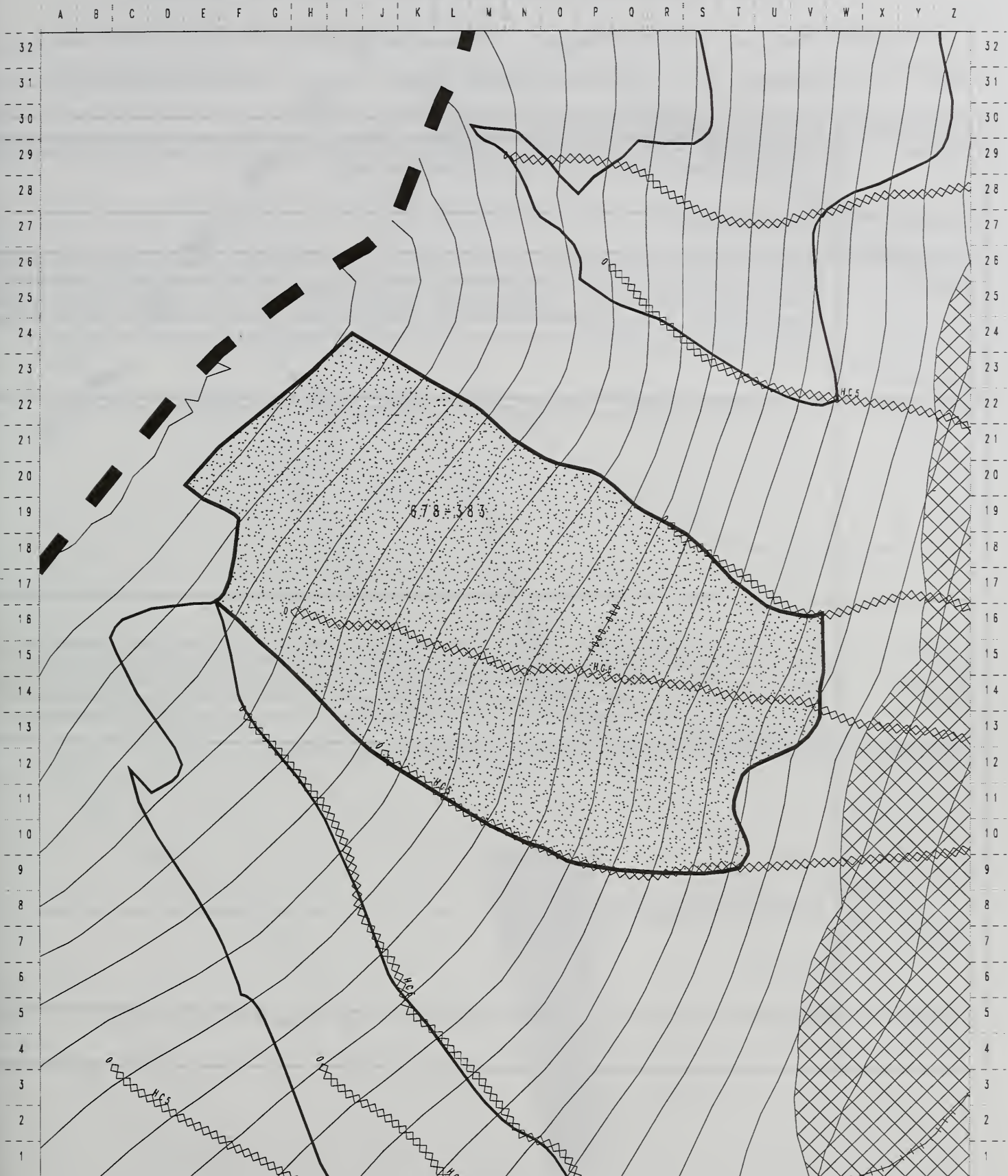
PHOTO YR/#: '91-390-106 1/4 QUAD: CRG A-2 NE 1/4 LOGGING SYSTEMS: HE

| REVIEWER&DATE                           | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97                       | SILVICULTURE/TIMBER: 67802-010. High windthrow risk, high elev. Productivity of site is moderate. Use streams as unit boundaries. Avoid oversteepen soils. Originally in HCA until TLMP revised. No field inspection.  |
| J. Oien 5/96                            | ROADS: No concerns.  |
| R.Johnson<br>6/96                       | SOILS/WATERSHED: Soils mapped 351D (Karta - Tolstoi 35-60%), with 34D (StNicholas - Shakan 35-60%), 33D (StNicholas - McGilvery 35-60%). Partial suspension for MM13, forested wetland, McGilvery (BMPs 12.5, 13.9; TLMP 1997). Prescribed helicopter yarding. May be steeper than mapped, based on photos. Probable slope break buffer V-notch N boundary, and O&W protection streams center and S boundary (BMP 13.16). Field review recommended during layout for possible unsuitable soils and slopes (BMP 13.5).  |
| D.Kuntzsch, 7/96                        | FISHERIES: Protect streams in unit per soils instructions. No other fisheries concerns identified during office review.  |
| M.Dillman<br>7/96<br>M.Dillman<br>12/97 | WILDLIFE:<br><br>This unit is within an old growth reserve. Wildlife did not survey this unit in either 1995 or 1996. If current policy is changed and this unit is harvested wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Also, if this unit is harvested, wildlife will need to conduct surveys in the area prior to harvest. Maintain 1000 foot estuary buffer. 12/97- This unit is no longer in an HCA and is now part of the unit pool and in alternative 6. Wildlife has not and has no intention of surveying this unit. If anything pertaining to wildlife is found during unit layout all current (TLMP 1997) will be met. |
| J.Baichtal                              | GEOLOGY MINERALS: No known geology, mineral, karst or cave resouce concerns.   |
| T.Fifield<br>10/28/96                   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                       | PRESCRIPTION: Overstory removal by helicopter. Retain spruce and cedar less than 18" DBH. Retain cedar seed trees on perimeter.  |



# Chosina Study Area Interim Layout NO1 Unit 678-383

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

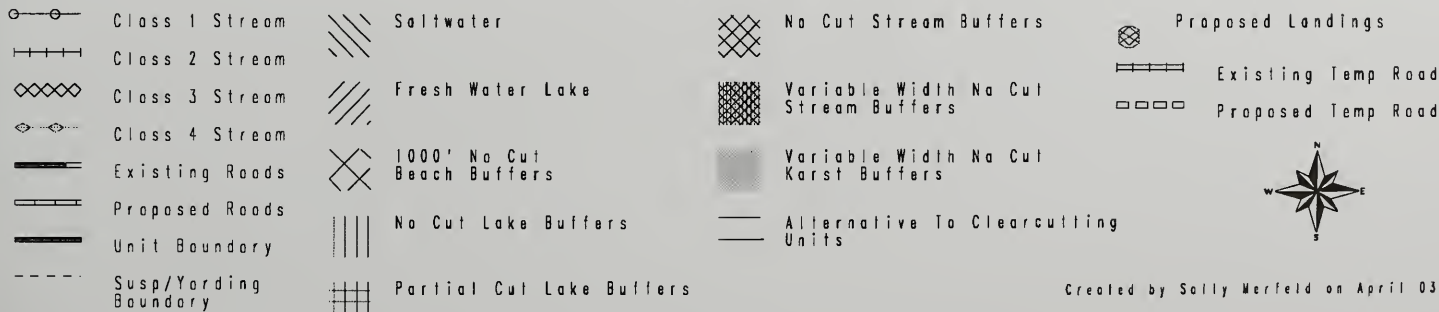
VCU-UNIT#: 678-385      ACRES: 50      VOL: 1250      MBE ALTERNATIVES: 4,5,6

PHOTO YR/#: '91-390-106      1/4 QUAD: CRG A-2 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                           | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                       | SILVICULTURE/TIMBER: 67802-048. High windthrow risk, high elev. Productivity of site is moderate. Use streams as unit boundaries. Originally in HCA until TLMP revised. No field inspection.  |
| J. Oien 5/96                            | ROADS: No concerns.   |
| R.Johnson<br>6/96                       | SOILS/WATERSHED: Soils mapped 351D (Karta - Tolstoi 35-60%), with 35D (StNicholas - Tolstoi 35-60%), 35E (StNicholas - Tolstoi 60-75%). Partial suspension for MMI3 and forested wetland (BMPs 12.5, 13.9). May be steeper than mapped based on photos. Helicopter yarding prescribed. Probable slope break buffer V-notch S boundary, and O&W protection streams center and N boundary (BMP 13.16). In second order watershed H05A which will have about 4% cumulative effect under alternatives 4,5 and 6 (BMP 12.1; TLMP 1997). Field review recommended during layout for probable unsuitable soils and slopes (BMP 13.5).  |
| D.Kuntzsch, 7/96                        | FISHERIES: Protect streams in unit per soils instructions. No fisheries concerns were identified during an office review.   |
| M.Dillman<br>7/96<br>M.Dillman<br>12/97 | WILDLIFE:<br><br>This unit is within an old growth reserve. Wildlife did not survey this unit in 1995 or 1996. If current policy is changed and this unit is harvested wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Also, if this unit is harvested wildlife will need to conduct surveys in the area prior to harvest. Maintain 1000 foot estuary buffer. 12/97- This unit is no longer in an HCA and is part of the unit pool and in alternative 6. Wildlife has not and has no intention of surveying this unit. If anything pertaining to wildlife is found during unit layout all current (TLMP 1997) standards and guidelines will be met. |
| J.Baichtal                              | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br>LANDS:   |
| T.Fifield<br>10/28/96                   | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                       | PRESCRIPTION: Overstory removal by helicopter. Retain spruce and cedar less than 18"DBH. Retain cedar seed trees on perimeter.  |

# Chosino Study Area Interim Layout NOI Unit 678-385

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-361      ACRES: 31      VOL: 518      MBF      ALTERNATIVES: 3,5,6

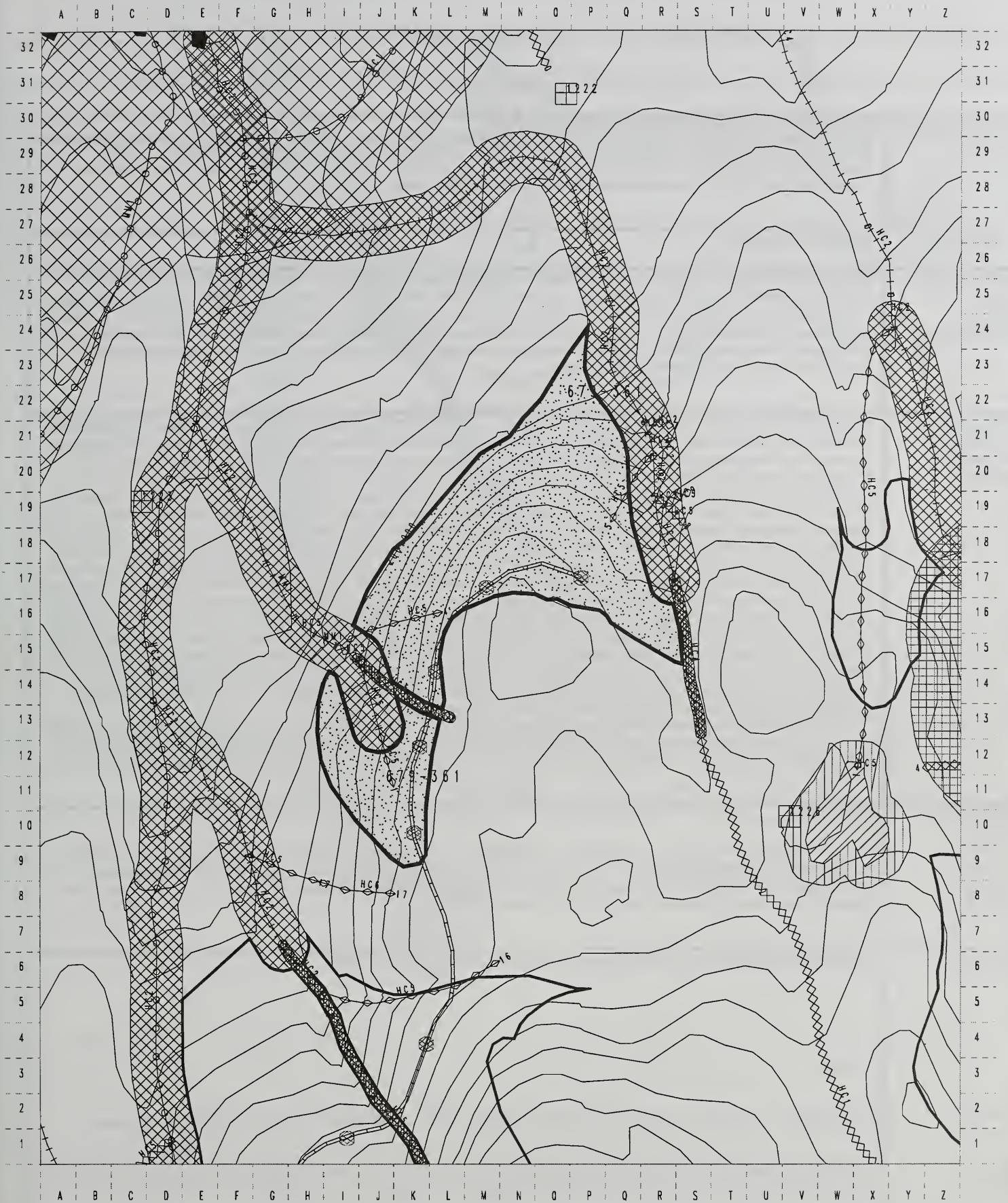
PHOTO YR/#: '91-390-225      1/4 QUAD: CRG B-1      SE 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67903-047, low windthrow risk, high mistletoe present. Unit changed to provide proportionality of volume classes. Productivity of site is low. Partial cut buffer. Set landings near edge of DROPOFF. Maintain YC component through planting if needed. Low economics, low volume area surrounding unit.   |
| J. Oien 5/96  | ROADS: No concerns.   |
| Field D. J. Landwehr<br>8/16/95<br>EIS R.Johnson                                      | SOILS/WATERSHED: Partial suspension is required throughout the unit for MMI3 and wetland soils (BMPs 12.5, 13.9). A 100' buffer is required on at least the lower portion of fisheries stream #2 (BMPs 12.6, 12.6a). The remainder of this stream should be given at least green and white protection (BMP 13.16). Two smaller streams on the west side of the unit should be given green and white protection (BMP 13.16). These two streams, plus additional streams, are designated for orange and white protection by fisheries. These differences in prescriptions can be reconciled during layout. Additional information is filed in the reconnaissance folder.  |
| M. Becker,<br>K. Buckley,<br>8/28/95,<br>8/29/95                                      | FISHERIES: Stream 1 is a class II blue/ white that requires a 120' TTRA buffer (BMP 12.6). The upper section of this stream was a class III orange/white, under the new TLMP (1997) standards the upper section of stream 1 is a class IV orange/ white because it is 3 feet wide, has 3 feet of incision and 14% gradient. The upper section of class 1 is flagged orange/ white to provide additional resource protection. Stream 2 is a class II blue/ white that requires a 120' TTRA buffer (BMP 12.6). The upper section of this stream is a class III orange/ white, that is 9 feet wide, has 45 feet of incision and 27% gradient. Stream 2 requires a slope break buffer. Stream 3 is a class III orange/ white that is 6 feet wide has 6 feet of incision and 49% gradient. Stream 3 requires a slope break buffer. Stream 4 was a class III orange/ white, under the new TLMP (1997) standards stream 4 is a class IV orange/ white because it is 2 feet wide has 3 feet of incision and 20% gradient. Stream 4 is flagged orange/ white to provide additional resource protection. Stream 5 was a class III orange/ white, under the new TLMP (1997) standards stream 5 is a class IV orange/ white because it is 3 feet wide has 3 feet of incision and 17% gradient. Stream 5 is flagged orange/ white to provide additional resource protection.<br>The orange/ white streams require directional falling, and split yarding or full suspension and immediate removal of introduced debris from the stream channel (BMP 13.16). Differences between soils and fisheries will be reconciled during unit layout. |
| M.Pacheco<br>6/27/95.<br>C.Tighe,<br>B.Johnston,<br>A.Mueller<br>6/26/96 &<br>7/19/96 | WILDLIFE:<br><br>Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/26/96 A pair of lesser yellow-legs in muskeg helispot. 7/19/96 Deer pellets and beds, bear scat, and game trails throughout the area. Unit 679-501 is the helicopter potion of this unit.  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: Although survey of this unit was planned for 1996, closer inspection suggests it lies in low sensitivity terraine. The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned..<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Leave cedar seed trees around perimeter if possible. Partial suspensoin required. Possible planting of cedar required, PCT at 25+ years.  |



# Chosino Study Area Interim Layout NOI Unit 679-361

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

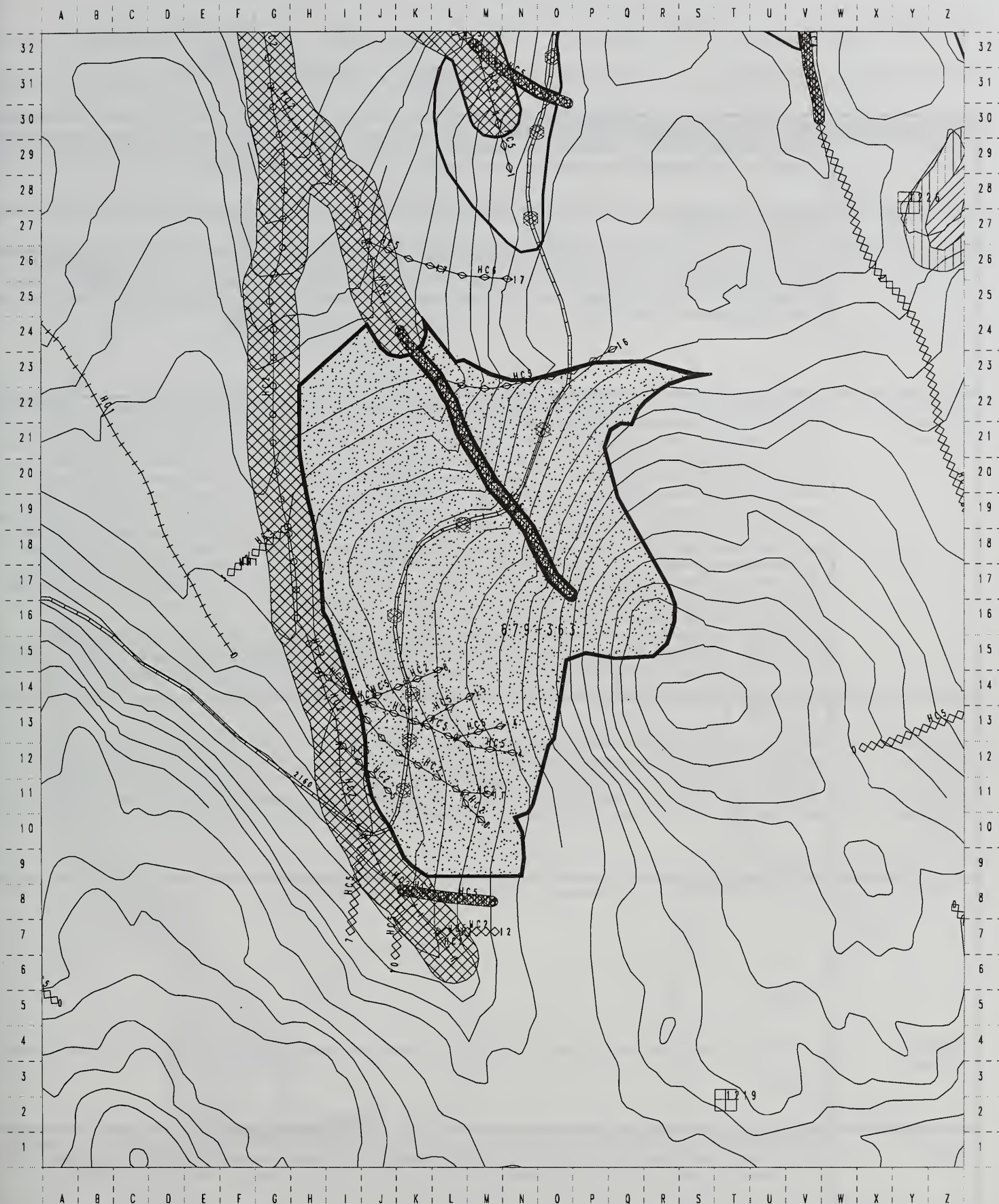
VCU-UNIT#: 679-363      ACRES: 66      VOL: 1650      MBF      ALTERNATIVES: 3, 5, 6

PHOTO YR/#: '91-390-225      1/4 QUAD: CRG B-1 SE 1/4      LOGGING SYSTEMS: HE,RS,LS

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67903-054, low windthrow risk. Unit changed to provide proportionality of volume classes. Productivity of site is moderate. Maintain setting width between units. Verify roads and/or landing locations. Uneconomic, low volume area surrounding. Six acres dropped for cliffs and low value timber.  |
| J. Oien 5/96   | ROADS: No concerns.  |
| Field D. J. Landwehr<br>8/17/95<br>EIS R.Johnson                         | SOILS/WATERSHED: Partial suspension for MMI3 and forested wetlands (BMPs 12.5, 13.9). Expand the 100' buffer in the north portion of the unit to encompass the lower portions of the V-notches because of MMI4 soils (BMP 13.5). Helicopter logging may be needed in the area upslope of the road, and the slope breaks along the water quality creeks (BMPs 13.9, 13.16). Additional protection of streams per fisheries. Additional roads may be required for the down slope portion of the unit below the break, and profiles may be necessary (BMPs 13.9, 14.1). Additional information is filed in the reconnaissance folder. Minor amounts of Kaikli soils present(TLMP 1997).   |
| D. Kuntzsch,<br>K. Buckley,<br>M. Becker,<br>8/25/95                     | FISHERIES: Stream 1 is a class I blue/white that requires a 120' TTRA buffer (BMP 12.6). Stream 2 is a class II blue/white that requires a 120' TTRA buffer (BMP 12.6); just downstream of the junction with stream 16, stream 2 becomes class III orange/white and requires a slope break buffer. Streams 16 and 17 were classified as class III green/white tributaries to stream 2, under the new TLMP (1997) standards streams 16 and 17 are class IV green/ white. Stream 4 was a class III orange/white tributary to stream 1, under the new TLMP(1997) standards stream 4 is a class IV orange/ white because it is 3 feet wide has 7 feet of incision and 17% gradient. Stream 4 is flagged orange/ white to provide additional resource protection. Streams 8 and 15 were green/white class III tributaries to stream 4, under the new TLMP (1997) standards streams 8 and 15 are class IV green/ white. Stream 14 was a class III orange/ white, under the new TLMP (1997) standards stream 14 is a class IV orange/white because it is 2 feet wide, has 3 feet of incision and 46% gradient. Stream 14 is flagged orange/ white to provide additional resource protection. Stream 5 was a class III orange/white tributary to stream 1, under the new TLMP standards stream 5 is a class IV orange/ white because it is 3 feet wide has 6 feet of incision and 30% gradient. Stream 5 is flagged orange/ white to provide additional resource protection. Streams 6 was a class III orange/ white, under the new TLMP (1997) standards stream 6 is a class IV orange/ white because it is 2 feet wide and has 7 feet of incision, gradient was not collected. Stream 6 is flagged orange/ white to provide additional resource protection. Stream 11 was a class III orange/ white, under the new TLMP (1997) standards stream 11 is a class IV orange/ white that is 2 feet wide, has 7 feet of incision and 11% gradient. Stream 11 is flagged orange/ white to provide additional resource protection. Stream 9 is a class III orange/ white, that is 5 feet wide, has 7 feet of incision and 11% gradient. Stream 9 is on the southern boundary and its north slope break should be used as the unit boundary.<br>The orange/white streams require directional falling, and split yarding or full suspension over, and immediate slash removal (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial over. Stream road crossings will require fish passage and timing on blue/white streams #1 and 2 (BMP 14.14). Follow soils protection instructions for V-notches. |
| M. Pacheco<br>6/27/95<br>C.Tighe,<br>B.Johnston,<br>A.Mueller<br>6/26/96 | WILDLIFE:<br><br>Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. There were two sensitive plants, <i>Platanthera chorisiana</i> , the choris bog orchid, found by a botanist in this unit in 1995. Harvesting this unit as it is currently laid out will destroy these plants. Changes in unit design will be done at the time of layout to try to avoid harm to the plants. A pair of lesser yellow-legs was seen in the muskeg helispot.   |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
|  | LANDS:   |
| T.Fifield<br>10/28/96  | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.   |
| J.Short<br>12/17/97  | VISUALS: To meet maximum modification VQO retain about (7) .5 to 1.5 acre islands randomly scattered along part of the back-line to soften the very pronounced edge created by this highly visible boundary.   |
| G.Lawton<br>12/97  | PRESCRIPTION: Southern 1/4 of unit around streams: patch cut by helicopter several cuts, totalling 4 acres (maximum cut this entry of the 17 acres of uneven-aged management prescribed). Northern portion of unit: overstory removal above the road by helicopter. Retain cedar and spruce less than 16" DBH for structure and soil protection and cedar propagation. Feather boundary, retaining 16" DBH in split lines and edges of unit where yarding corridors allow (pie-shaped retention areas on lower boundary). Areas of scrub and cliffs to the east are dropped. PCT at 20 years.  |

# Chosina Study Area Interim Layout NOI Unit 679-363

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Portial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-367      ACRES: 39      VOL: 250      MBF      ALTERNATIVES: 3, 5, 6

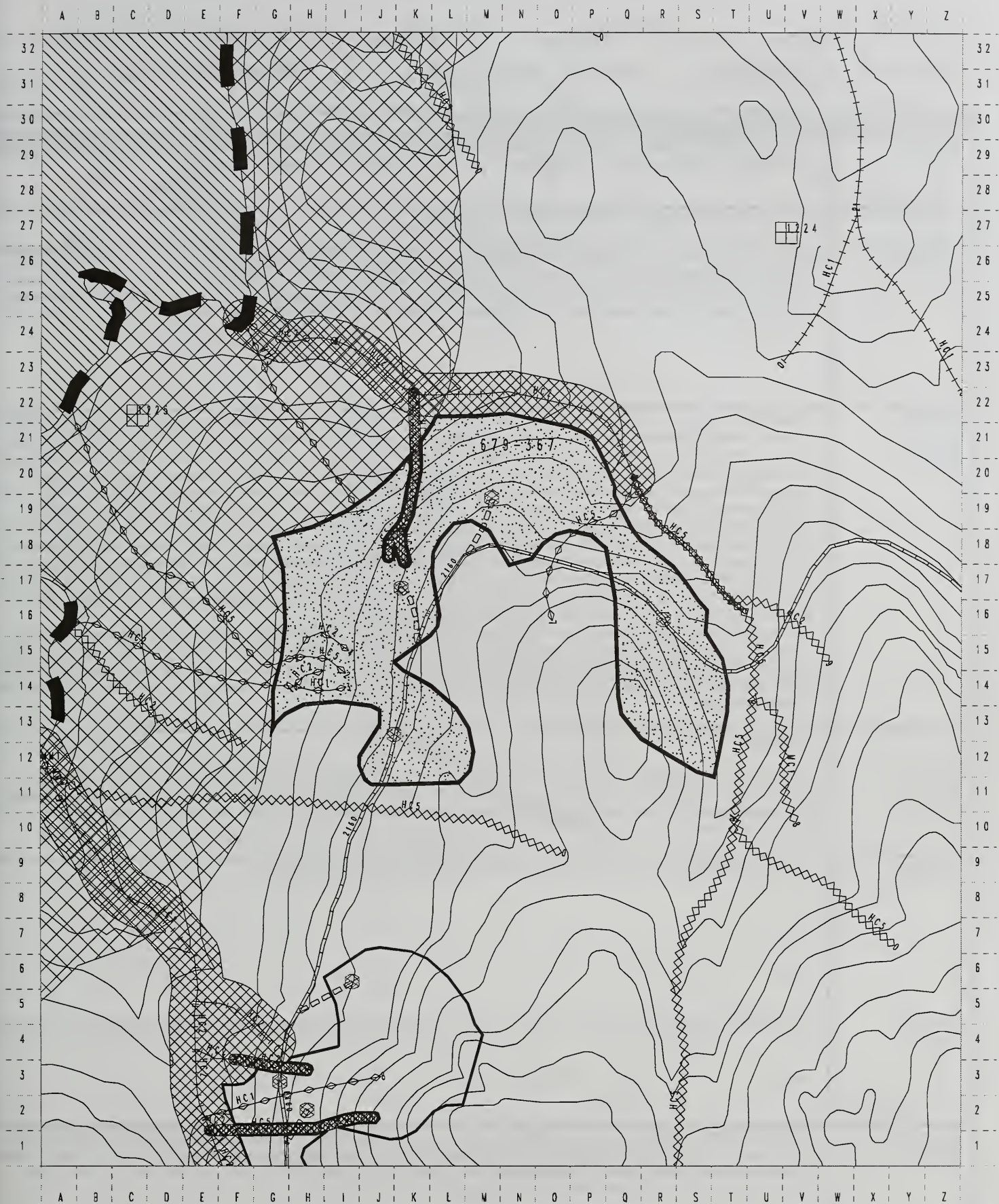
PHOTO YR/#: '71(51)-1472-46      1/4 QUAD: CRG B-1 SE 1/4      LOGGING SYSTEMS: RS,SL

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67903-058, low windthrow risk. Productivity of site is moderate. Uneconomic, low volume area surrounding. Split-yarding required on stream where possible. Dropped 4 acres due to scrub timber.   |
| J. Oien 5/96  | ROADS: No concerns.  |
| R.Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 57D (Petrel 35-60%), with 550C (StNicholas - Kaikli 5-35%). Partial suspension for forested wetlands (BMPs 12.5, 13.9). May need adjustment of boundary lines to exclude and protect non-harvestable low volume wetlands (BMP 12.5), and to delineate a harvestable unit. Protection of streams per fisheries (BMPs 12.6a, 13.16). Minor amounts of Kaikli soils present (TLMP 1997).  |
| D. Kuntzsch,<br>M. Becker,<br>9/1/95                                      | FISHERIES: Stream 6 along east and north boundaries is a class II blue/white that requires a slope break buffer plus 100' TTRA (BMP 12.6). At the confluence of streams 7 and 6, stream 6 becomes a class III orange/white. Stream 6 requires a slope break buffer for this reach; in some cases the slope break is a rock ledge or cliff. Stream 5 is a class III orange/white that is 7 feet wide, has 8 feet of incision and 21% gradient. Stream 5 requires a slope break buffer. Stream 7 was a class III orange/white, under the new TLMP (1997) standards stream 7 is a class IV orange/white that is 2 feet wide has 2 feet incision and 22% gradient. Stream 7 is flagged orange/white to provide additional resource protection. Stream 10 was a class III orange/white, under the new TLMP (1997) standards stream 10 is a class IV orange/white. Stream 10 is outside the unit boundary. Below the unit, stream 1 is a class II orange/white, but in the unit it was a class III green/white, under the new TLMP (1997) the class III green/white section of stream 1 is a class IV green/white. Stream 3 was a class III green/white tributary to stream 1, under the new TLMP (1997) standards stream 3 is a class IV green/white. Stream 2 was a class III orange/white, under the new TLMP (1997) standards stream 2 is a class IV orange/white because it is 3 feet wide has 7 feet of incision and 18% gradient. Stream 2 is flagged orange/white to provide additional resource protection. Stream 4 was a class III green/white (trib. to stream 2), under the new TLMP (1997) standards it is classified as a class IV green/white. The orange/white streams require directional falling, and split yarding or full suspension over, and immediate slash removal (BMP 13.16). The green/white streams require directional falling, and split yarding (where practical) and partial suspension over. Clean streams of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16). |
| M.Dillman,<br>B.Johnston<br>8/31/95<br>C.Tighe,<br>B.Johnston,<br>7/11/96 | WILDLIFE:<br><br>Deer, bear and wolf signs. Two wolf killed deer found. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Unit is within a half mile of known bald eagle nest. Road construction must be accomplished in accordance with the requirements of the Bald Eagle Protection Act and must also comply with the MOU between the U.S. Fish and Wildlife Service and the Forest Service. Written coordination with the U.S. Fish and Wildlife Service needs to be documented. 7/11/96 Deer sign was seen throughout the unit. Maintain 1000 foot estuary buffer.  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: This unit was surveyed in 1996. No cultural resources were noted. There are no concerns with the unit as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: Partial suspension required. Expect wetland soils unit falldown. Unevenaged group selections, 1-2 acres in size covering 1/4 of the unit. Shape cuts above the road in triangles for easy downhill yarding with slackline system. Shape cuts below the road in corridors 150' wide for running skyline. Possible release to lessen mistletoe infection. PCT at 25+ years.  |



# Chosino Study Area Interim Layout N01 Unit 679-367

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Korst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



Created by Sally Werfeld on April 03, 1998



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-378      ACRES: 29      VOL: 608      MBF      ALTERNATIVES: 3,5,6

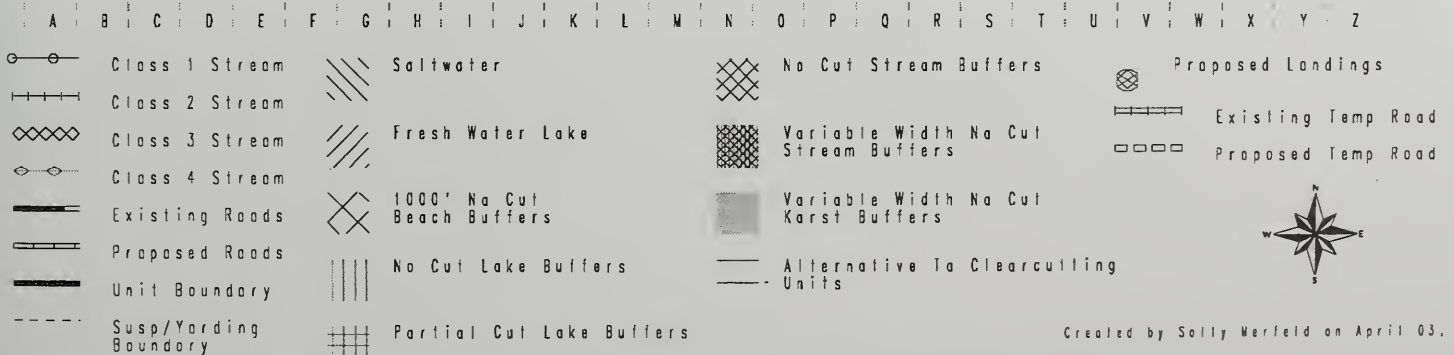
PHOTO YR/#: '71(51)-1472-45      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: LS

| REVIEWER&DATE                                     | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                                 | SILVICULTURE/TIMBER: 67903-021, moderate windthrow risk, majority downhill yarded. Retain stand structure for wildlife where feasible. Partial cut buffer. Productivity of site is low. Maintain setting width between units.   |
| J. Oien 5/96                                      | ROADS: Evaluate temporary roads for specified road criteria.  |
| R.Johnson<br>6/96                                 | SOILS/WATERSHED: Soils mapped 550C (StNicholas - Kaikli 5-35%), 57D (Petrel 35-60%), 3D (Vixen - Traitors 35-60%). Primarily forested wetlands, which corresponds to a need for a minimum of partial suspension (BMPs 12.5, 13.9). Protection of streams per fisheries (BMPs 12.6a, 13.16). Silviculture deleted pockets of scrub and steep slopes in the southeast portion of unit. Deletion of scrub may meet requirement to defer harvest on Kaikli soils(TLMP 1997). Minor amounts of Kaikli soils found in unit (TLMP 1997).   |
| D. Kuntzsch,<br>B. Steel,<br>R. Reeves,<br>8/1/95 | FISHERIES: Stream 1 is a class II blue/white (TTRA) along most of the west unit boundary. Approximately at the confluence of stream 6, stream 1 becomes a class III orange/white that requires a slope break buffer and a 25-50' windfirm edge to protect the V-notch. Stream 2 is a class III orange/ white that is 5 feet wide, has 7 feet incision and 17% gradient. Stream 2 is on the southern boundary of the unit and the north slope break of stream 2 should be the unit boundary. Streams 3, 4, and 5 are class III orange/white, but are outside the current south boundary of the unit. Streams 6 was a class III orange/ white, under the new TLMP (1997) standards stream 6 is a class IV orange/ white that is 3 feet wide, has 15 feet of incision and 20% gradient. Stream 6 is flagged orange/ white to provide additional resource protection. Stream 7 is a class III orange/white, that is 5 feet wide, has 15 feet of incision and the gradient was not collected. Stream 7 requires a slope break buffer. Stream 8 was a class III green/ white, under the new TLMP (1997) standards stream 8 is a class IV green/ white. Streams 9 and 10 are class II blue/ white that require 120' TTRA buffers (BMP 12.6). Stream 9 becomes a class III orange/ white. Stream 9 is 5 feet wide, has 3 feet of incision and 8% gradient. Stream 9 does not have a class III buffer because most of the stream is outside the unit boundary, where stream 9 is in the unit the southern slope break of stream 9 should be the unit boundary.<br>The orange/ white streams require directional falling, and split yarding or full suspension, and immediate slash removal (BMP 13.16, 12.6). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris before the end of the operating period or before the yarder leaves the area. Roads crossing blue/white streams will require fish passage and timing (BMP 14.14). Stream 1 should be shocked along western unit boundary to make sure of stream class call. |
| C.Tighe,<br>B.Johnston<br>7/1/96                  | WILDLIFE:<br><br>This unit has been identified as an important wildlife travel corridor. Partial harvest is recommended to maintain forest structure and lessen the impact on wildlife migration and dispersal. This unit was not surveyed during 1995, as it did not meet the habitat requirements called for in the current goshawk protocols. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Deer sign seen throughout unit.  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96                             | LANDS:<br><br>CULTURAL: This unit was surveyed in 1996. No cultural resources were noted. There are no concerns with the unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                                 | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Delete 7 acres (2 for uneconomical scrub, 2 steep, 3 unreachable). May require live skyline system for steep downhill portions. Leave cedar trees on perimeter where possible. Monitor for planting needs. PCT at 25+ years.  |



# Chasino Study Area Interim Layout NOI Unit 679-378

Mapscale 1:7920 (8 inch to Mile)



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-379      ACRES: 4      VOL: 95      MBF      ALTERNATIVES: 3,5,6

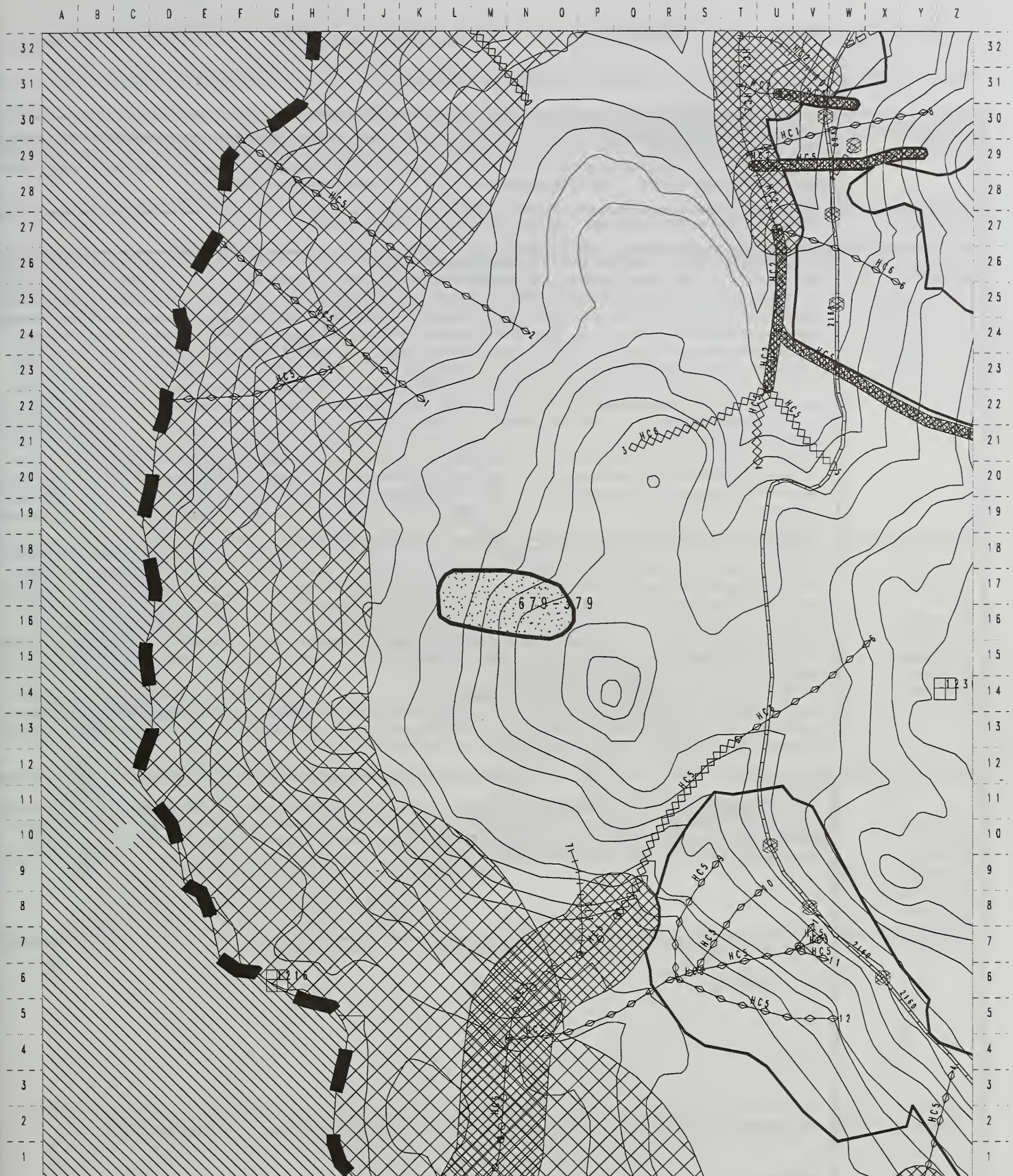
PHOTO YR/#: '71(51)-1472-45      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                                   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97                               | SILVICULTURE/TIMBER: 67903-011, low windthrow risk. Productivity of site is moderate. Uneconomic, low volume area surrounding. Very small stand of merchantable timber.  |
| J. Oien 5/96                                    | ROADS: No concerns.  |
| R.Johnson<br>6/96                               | SOILS/WATERSHED: Soils mapped 550C (StNicholas - Kaikli 5-35%). Partial suspension for forested wetlands (BMPs 12.5, 13.9). May need to adjust boundary lines for harvestable timber, particularly a deletion along the center of the S boundary line for exclusion of low volume timber. No streams evident. Possible non-streams should be protected by partial suspension (BMP 13.16). Change from road and cable logging to helicopter yarding should provide full suspension (BMP 13.9). Silviculture deleted north portion of unit. Minor amounts of Kaikli soil present(TLMP 1997).                 |
| D.Kuntzsch, 7/96                                | FISHERIES: Office review revealed no apparent fisheries concerns.  |
| C.Tighe,<br>B.Johnston,<br>A.Mueller<br>6/19/96 | WILDLIFE:<br><br>This unit is within one-half mile of a known bald eagle nest. Road construction must be accomplished in accordance with the Bald Eagle Protection Act and must also comply with the MOU between the U.S. Fish and Wildlife Service and Forest Service. Written coordination with the U.S. Fish and Wildlife Service needs to be documented. This unit did not rate as a high priority area for wildlife because of its size, only 4 acres. It was not surveyed during 1995. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. |
| J. Baichtal                                     | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                           | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                               | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 5% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut. 3 acres with helicopter optional. PCT at 25+ years.  |



# Chasina Study Area Interim Layout N01 Unit 679-379

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



Created by Solly Werfeld on April 03, 1998



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-382      ACRES: 42      VOL: 613      MBF      ALTERNATIVES: 3, 4, 5, 6

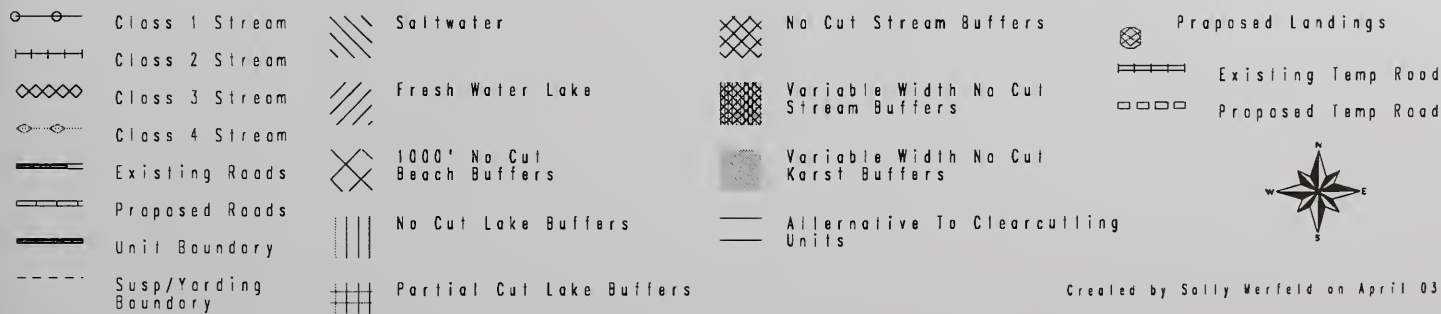
PHOTO YR/#: '71(51)-1472-44      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67903-011, high windthrow risk, small portion downhill yarded. Retain stand structure for wildlife where feasible. Maintain setting width between units. Road line was moved upslope and further east. Helicopter yarding method above cable reach is optional. Steep eastern portion dropped due to resource protection. (502).  |
| J. Oien 5/96  | ROADS: Numerous stream crossings - evaluate split yarding and road network.  |
| R.Johnson<br>6/21/96  | SOILS/WATERSHED: Top of unit should be deleted because of blind-lead and lack of suspension required for forested wetlands (BMPs 12.5, 13.9). New upper backline varies from about 500' elevation in the southeast corner, drops to 400' in the center of the unit, climbs back to 675', and then drops to 500' at the v-notch of fisheries stream #6. Elevations were measured in the field and may not correspond to those shown on the unit map. A slope break buffer is the north boundary of the unit on this class III orange and white stream (BMPs 12.6a, 13.16). The side slope portion of the unit lies between the break on the top down to 300' elevation. Recommend partial suspension of this portion of the unit because of unstable MM14 soils, past slides, slopes >72%, and McGilvery to protect fish streams, a limited volume available for harvest, and impacts from constructing the 2160 road (BMPs 12.6, 13.1, 13.5, 14.2; TLMP 1997). Recommend full suspension if this portion of the unit is harvested (BMPs 13.5, 13.9). Bottom portion of the unit lies between 300' and 200' elevation. The lower boundary of the unit is defined by the limits of commercial timber. Boundary in the southwest portion of the unit can be expanded from that shown on the unit map to include lands formerly in 679-502 that are outside of buffers for fisheries streams 1 through 5. Partial suspension in bottom portion of unit for forested wetlands, McGilvery, protection of fisheries streams, and protection of nonstreams and seeps (BMPs 12.5, 12.6, 12.6a, 13.9, 13.16; TLMP 1997). Should expand south boundary of unit to existing clearcut because of blowdown. Partial suspension on this addition for forested wetlands (BMPs 12.5, 13.9). Protect streams per fisheries (BMPs 12.6, 12.6a, 13.16). Minor amounts of Kitkun soil present (TLMP 1997). Unit lies in third order watershed 000Z. Additional information is filed in the reconnaissance folder. |
| K. McCartney,<br>H.Roerick,<br>K.Buckley,<br>8/1/95<br>B. Johnston,<br>K. Buckley,<br>M. Solomon,<br>R. Johnson,<br>6/21/96 | FISHERIES: Stream 1 is a class I blue/ white that requires 120' TTRA buffer. Stream 2 is a class III orange/ white that requires a 25' buffer because it is flowing through an unstable alluvial fan directly above fish habitat (BMP 13.16). Stream 4 is a class I blue/ white streams that requires a 140' TTRA buffer. At 240' of elevation stream 4 becomes a class III orange/ white, under the new TLMP (1997) stream 4 is a class IV orange/ white. The upper section of stream 4 is flagged orange/ white to provide additional resource protection. Stream 6 is a class II blue/white that requires a 200' TTRA buffer (BMP 12.6). Streams 3 is a class III orange/ white that is 6 feet wide, has 3 feet of incision and 18% gradient. Stream 3 requires a slope break buffer. Stream 5 is a class III orange/ white that is 6 wide, has 8 feet of incision and 47% gradient. Stream 5 requires a slope break buffer. Streams 9, 10, 11, and 12 are class IV green/white. The orange/white streams require directional falling, and split yarding or full suspension over, and immediate removal of introduced logging debris (BMP 13.16). The green/white streams require directional falling, and split yarding (where practical) or partial over. These streams must be cleaned of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16, 12.6). A lot of blowdown and wet soils noted in unit.  |
| M. Pacheco<br>7/20/95<br>B.Johnston,<br>K.Buckley,<br>R.Johnson,<br>M.Solomon<br>6/21/96                                    | WILDLIFE:<br>This unit identified as an important wildlife travel corridor. Partial harvest is recommended to maintain forest structure and lessen impact on wildlife migration and dispersal. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Four CMT's, (Culturally Modified Trees), found in the unit, 2 in live trees and 2 in snags. Deer browse and pellets seen in unit. Woodpecker species heard. Alder in overstory. Unit 679-502 is the helicopter portion of this unit.  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: This unit was surveyed in 1996 to determine if historic materials associated with the Saco and Equator Prospects are located in or near the unit. No cultural materials were noted. There are no concerns with the unit as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: Clear-cut w/ reserves; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Potential suspension required. Dropped NE steep portion (presale check if helicopter option). Dropped scrub in center. Salvage windthrow patch in SE. Move unit to existing clearcut. Presale needs to pick up the windthrow and protect the streams in NW corner. Regeneration harvest (cc) the remainder of unit. May have to plant YC for retention of species. PCT at 20 years.  |



Mapscale 1:7920 (8 inch to Mile)

Mapscale 1:7920 (8 inch to Mile)



Created by Sally Werfeld on April 03, 1998

# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-383      ACRES: 7      VOL: 95      MBF      ALTERNATIVES: 3, 6

PHOTO YR/#: '71(51)-1472-45/'91-390-223      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: RS

| REVIEWER&DATE                                    | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97                                | SILVICULTURE/TIMBER: 68002-025 , high windthrow risk. Productivity of site is low. Uneconomic, low volume area surrounding. Maintain setting width between units, unless can be connected into one.   |
| J. Oien 5/96                                     | ROADS: No concerns.   |
| R.Johnson<br>6/96                                | SOILS/WATERSHED: Soils mapped 550C (StNicholas 5-35%) and 86CD(Kaikli-Grindell 5-60%). Partial suspension for forested wetland (BMPs 12.5, 13.9). Concerns whether adequate tail holds and anchors for guy lines for suspension. Probable stream(s) needing protection (BMP 13.16). May be slight potential to expand unit. Third order watershed E92A will have about 227% cumulative effect under alternative 3 (BMP 12.1; TLMP 1997). Minor amounts of Kaikli soils present (TLMP 1997). |
| K.Buckley, 8/96                                  | FISHERIES: GIS review shows potential for one class III orange/ white stream. The north slope break of this stream should be the unit boundary.   |
| C. Tighe,<br>B.Johnston,<br>A.Mueller<br>6/14/96 | WILDLIFE:<br><br>This unit did not rate as a high priority area for wildlife because of its size of only 9 acres. It was not surveyed during 1995. Deer sign, browse, beds, and game trails seen in unit. Bear sign seen as well. One dead deer found in area. Fisheries crew reported seeing a mouse-like mammal along the creek. Sparse/scrub timber. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density.                       |
| J.Baichtal                                       | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96                            | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                                | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. PCT at 25+ years.  |



# Chosina Study Area Interim Layout NOI Unit 679-383

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |

## CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-384      ACRES: 14      VOL: 210      MBF ALTERNATIVES: 3, 6

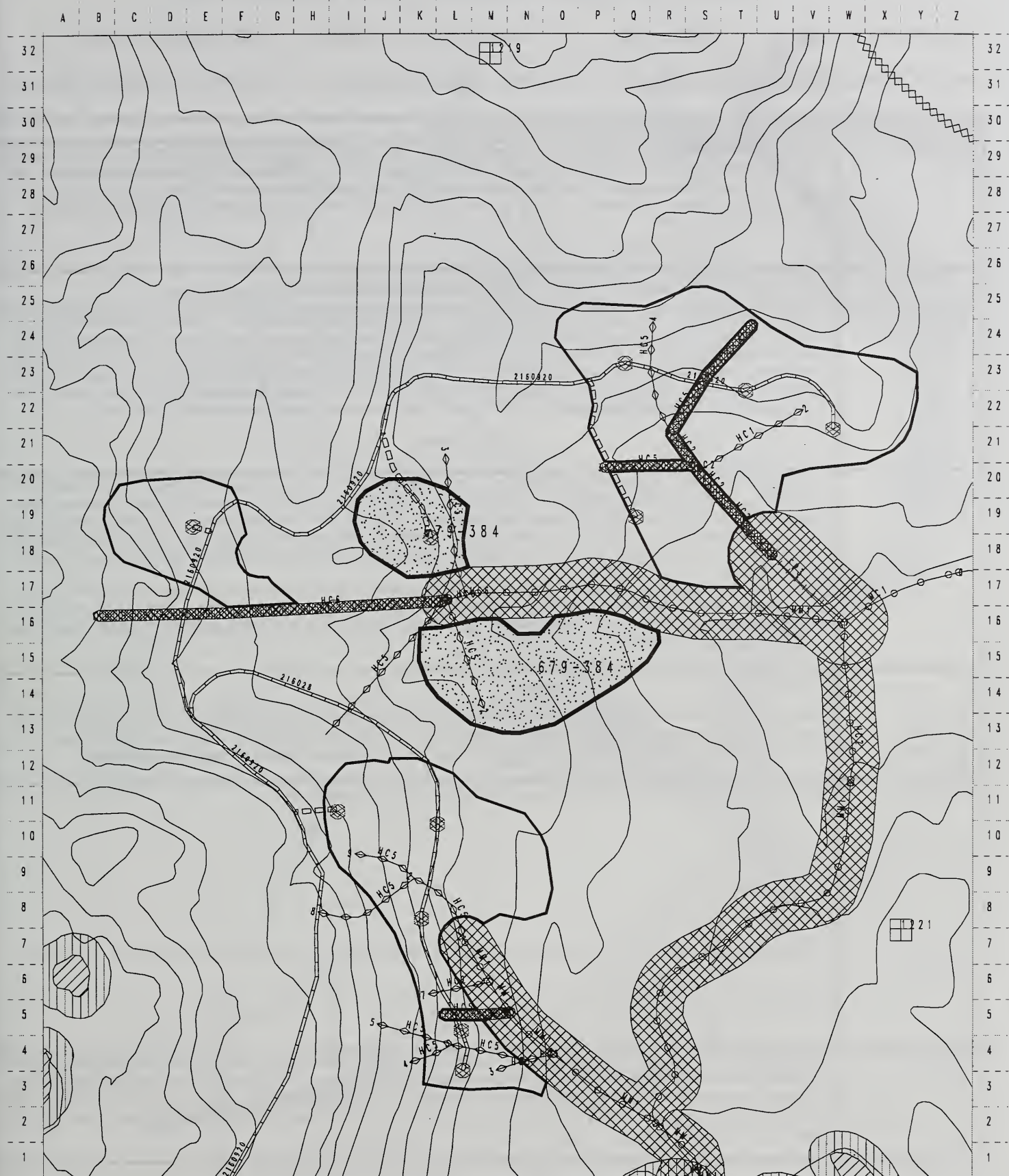
PHOTO YR/#: '71(51)/1472-45/'91-390-224 1/4 QUAD: CRG A-1 NE 1/4 LOGGING SYSTEMS: RS/HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 68002-019, low windthrow risk. Productivity of site is low. Maintain setting width between units. Uneconomic, low volume area surrounding. Depending on final road location - may want to drop portion north of northernmost creek.  |
| J. Oien 5/96   | ROADS: No concerns.   |
| R. Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 550C (StNicholas - Kaikli 5-35%) and 86CD (Kaikli - Grindall 5-60%). Partial suspension for forested wetlands (BMP 12.5, 13.9). Concerns whether adequate tail holds and anchors for guy lines for suspension. Potential to expand unit to limits of merchantable timber. Protection of streams as designated by fisheries (BMPs 12.6, 12.6a, 13.16). Third order watershed E92A will have about 27% cumulative effect under alternative 3 (BMP 12.1; TKLMP 1997). Shovel yarding must meet standards of slopes, drainages, topography, walking on waste wood to protect wetland soils, etc., per BMP 13.9. Minor amounts of Kaikli soil present (TLMP 1997).   |
| K. McCartney,<br>J. Frank,<br>8/1/95<br>K.McCartney,<br>S.Deck,<br>K.Kitchel,<br>6/14/96 | FISHERIES: Stream 1 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Above the confluence with stream 3, stream 1 is a class II blue/ white that requires a 120' TTRA buffer (BMP 12.6). Above the confluence with stream 4, stream 1 was a class III orange/ white,. Stream 1 is outside the unit boundary at this point. Stream 2 is a class IV green/ white. Stream 3 is a class IV green/ white. Stream 4 is a class IV green/ white.<br><br>The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16). Road crossing stream 1 will require fish timing (BMP 14.14). |
| C.Tighe,<br>B.Johnston,<br>A.Mueller<br>6/14/96  | WILDLIFE:<br><br>This unit did not rate as a high priority area for wildlife due to its low volume class. It was not surveyed during 1995. Deer and bear sign seen in unit: scat, pellets, beds, and trails. One dead deer found near unit. Fisheries crew reported seeing a mouse-like mammal in the area. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density.   |
| J.Baichtal<br><br><br><br><br><br><br><br><br><br>T.Fifield<br>10/28/96                  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br><br><br><br><br><br><br><br><br>LANDS:<br><br><br><br><br><br><br><br><br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br><br><br><br><br><br><br><br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Partial suspension required. Shovel yard eastern 1/2 is an option. South portion prescribed as helicopter may be cable option. Unit is part of a complex of units where uneconomical if not all yarded. Close road after yarding - no future settings available. PCT at 25+ years.  |



# Chosina Study Area Interim Layout NOI Unit 679-384

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

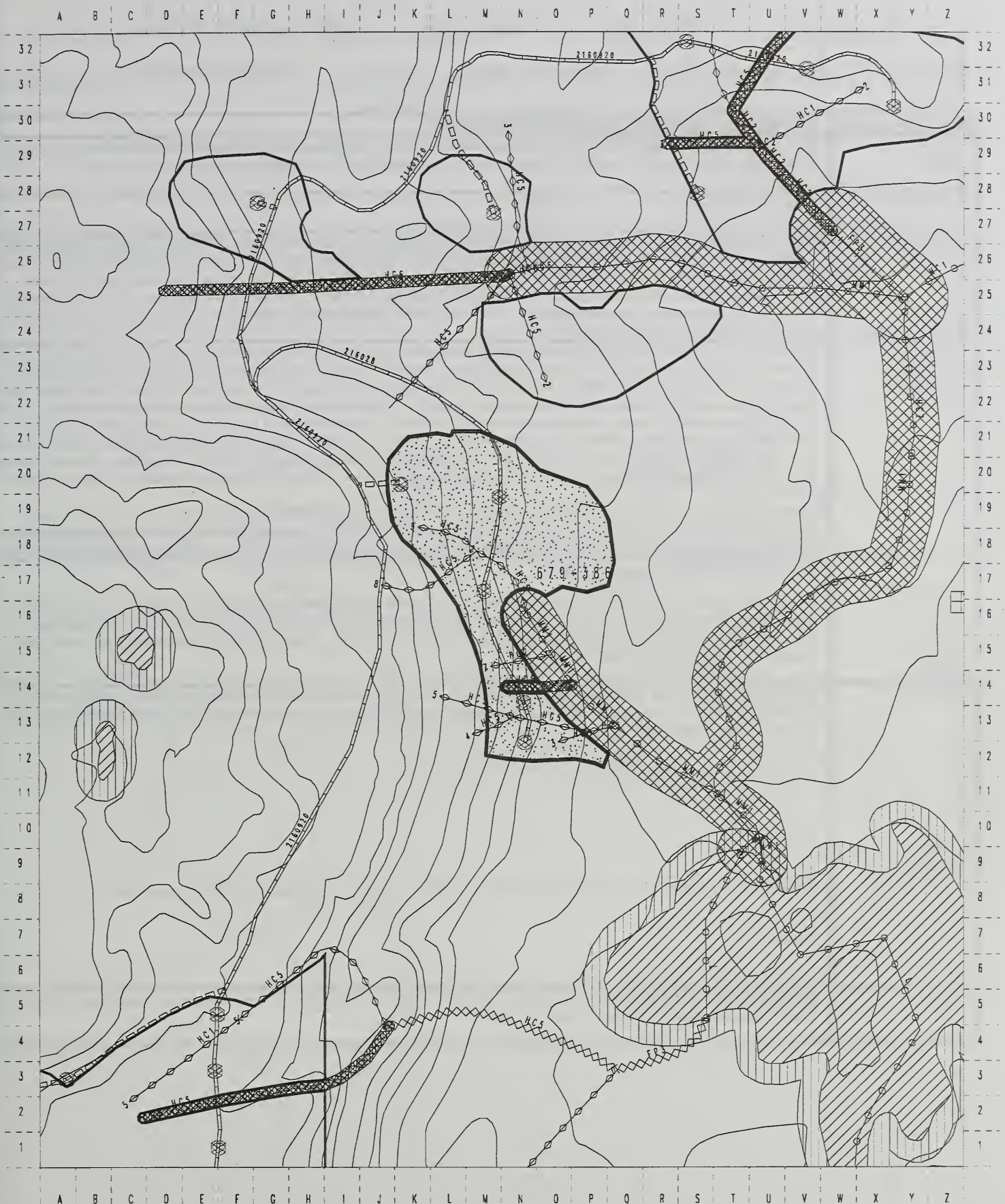
VCU-UNIT#: 679-386      ACRES: 19      VOL: 375      MBF      ALTERNATIVES: 3, 6

PHOTO YR/#: '71(51)-1472-45/'91-390-224 1/4 QUAD: CRG A-1 NE 1/4 LOGGING SYSTEMS: RS

| REVIEWER&DATE                                   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                               | SILVICULTURE/TIMBER: 68002-010, moderate windthrow risk, portion downhill yarded. Productivity of site is moderate. Partial cut buffer. Maintain setting width between units, or join with unit 384. Uneconomic, low volume area surrounding. Adjust road upslope as far as possible. May have to drop steep center and area to the west above it. Reach up to NW as far as possible. Optional western road coming from the south may replace eastern bottom road. Maintain YC component by planting. Commercial thin if uphill.  |
| J. Oien 5/96                                    | ROADS: No concerns.   |
| R.Johnson<br>6/96                               | SOILS/WATERSHED: Soils mapped 550C (StNicholas - Kaikli 5-35%), with 86CD (Kaikli - Grindall 5-60%) and 3D(Vixon-Traitors 35-60%) . Steeper slopes and McGilvery noted by silviculture. Partial suspension for forested wetlands, MMI3, and McGilvery (BMPs 12.5, 13.9; TLMP 1997). Concerns whether there are adequate tail holds and anchors for guy lines to obtain suspension. Better timber to NW may be limited by reach from the road. May need to extend roading to S because of curve of hillslope (BMP 14.2). Protect streams per fisheries (BMPs 13.16, 12.6a). Third order watershed E92A will have about 27% cumulative effect under alternative 3(BMP 12.1;TLMP 1997). Minor amounts of Kaikli soils present (TLMP 1997).   |
| K. McCartney,<br>J. Hannon,<br>8/1/95           | FISHERIES: Streams 1 (outside the unit) and 2 are class I blue/white TTRA. They require 120' TTRA buffers (BMP 12.6). Stream 6 is a class III orange/ white that is 5 feet wide, has 13 feet of incision, and 15% gradient. Stream 6 requires a slope break buffer. Stream 7 was a class III orange/white, under the new TLMP (1997) standards stream 7 is a class IV orange/ white that is 3 feet wide, has 6 feet of incision and 8% gradient. Stream 7 is flagged orange/ white to provide additional resource protection. Streams 3, 4, 5, 8, and 9 were class III green/white, under the new TLMP (1997) standards these streams are class IV green/ white.<br>The orange/ white streams require directional falling, and split yarding or full suspension over, and immediate removal of introduced logging debris (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced logging debris before the end of the operating period or before the yarder leaves the operating area (BMP 13.16, 12.6a). |
| C.Tighe,<br>B.Johnston,<br>A.Mueller<br>6/14/96 | WILDLIFE:<br><br>This unit did not rate as a high priority for wildlife due to its low volume class. It was not surveyed in 1995. Deer and bear sign seen in unit: trails, scat, pellets, beds. One dead deer found near unit. Fisheries crew reported seeing a mouse-like mammal in the area. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density.  |
| J.Baichtal                                      | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br>LANDS:   |
| T.Fifield<br>10/28/96                           | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                               | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type B clear-cut. Complicated yarding near buffers and steep cliffs at the north end. Roading options and steep areas may force a reconfiguration of unit. Part of unit complex where economical only if all units are harvested. Retain YC seed trees along perimeter. Monitor for possible planting of YC. PCT at 25+ years.  |

# Chosina Study Area Interim Layout NOI Unit 679-386

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

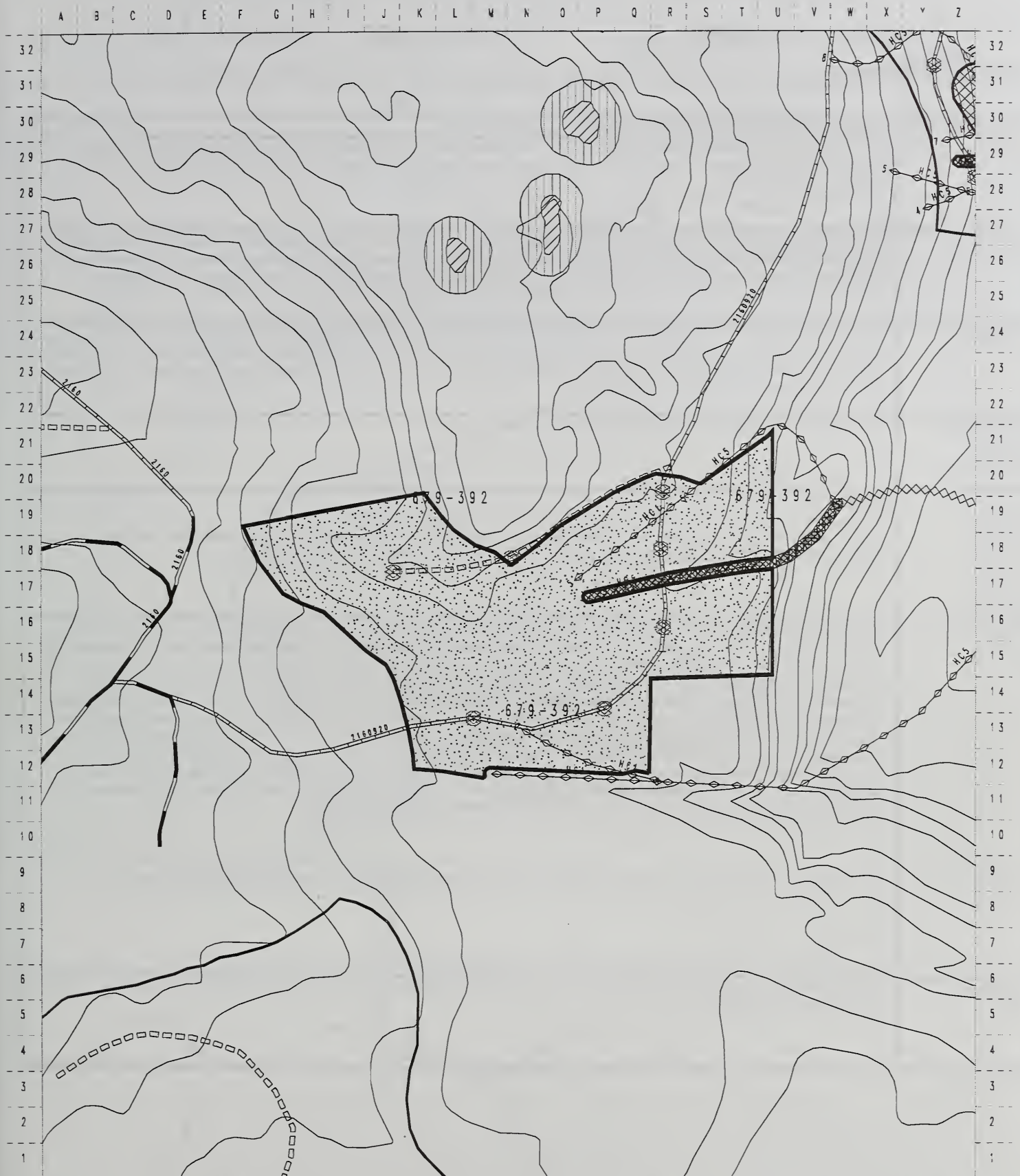
VCU-UNIT#: 679-392      ACRES: 49      VOL: 1800      MBF      ALTERNATIVES: 3, 4, 6

PHOTO YR/#: '71(51)-1472-44;2090-167 1/4 QUAD: CRG A-1 NE 1/4 LOGGING SYSTEMS: RS, SL, SH

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 68002-008, moderate windthrow risk. Unit changed to provide proportionality of volume classes. Productivity of site is high. Protect karst features. Even-aged stand of VC 6: too large for partial cut prescription.  |
| J. Oien 5/96  | ROADS: No concerns.   |
| R. Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped primarily 3D (Vixen - Traitors 35-60%), with 550C (StNicholas - Kaikli 5-35%) and 4D (Helm 35-60%) on the north end, and 28 (McGilvery & Tolstoi 5-60%) on the south end. Partial suspension for forested wetlands and McGilvery (BMPs 12.5, 13.9; TLMP 1997). Shovel yarding per BMP 13.9. Unit lies in third order watersheds E92A and 000Z. Both will have about 27% cumulative effect under alternative 3(BMP 12.1; TLMP1997). May need field review during layout as may be more wet than mapped (BMP 13.2; TLMP 1997) . Defer harvest on Kaikli soils (TLMP 1997). Additional information is filed in the reconnaissance folder.  |
| J. Frank,<br>M. Pacheco,<br>D. Kennemore<br>7/25/95                     | FISHERIES: Stream 1 was a class III orange/ white, under the new TLMP (1997) standards it is a class IV orange/ white that is 3 feet wide, incision was not collected, and has 8% gradient. Stream 1 is flagged orange/ white to provide additional resource protection. Stream 2 was a class III orange/ white, under the new TLMP (1997) standards it is a class IV orange/ white that is 3 feet wide, incision was not collected, and has 8% gradient. Stream 2 is flagged orange/ white to provide additional resource protection. Stream 3 was a class III orange/ white, under the new TLMP (1997) standards stream 3 is a class IV orange/ white because it is 3 feet wide, incision was not collected, and has 8% gradient. Stream 3 is flagged orange/white to provide additional resource protection. Stream 4 is a class III orange/ white, that is 5 feet wide, incision was not collected, and has 31% gradient. Stream 4 requires a slope break buffer. Stream 5 was a class III green/ white, under the new TLMP (1997) standards stream 5 is a class IV green/ white.<br><br>The orange/ white streams require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16). The green/ white stream requires directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16). |
| M.Pacheco,<br>J.Baichtal<br>7/25/95<br>C.Tighe,<br>A.Mueller<br>6/20/96 | WILDLIFE:<br><br>Game trails common. Wolf howls heard. Karst in area. To provide for adequate snag density and distribution within the VCU, recommend leaving 0.1 acre or larger snag patch for each 10 acres of unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/20/96 Deer sign, pellets: beds, browse and trails seen in unit. Karst in unit. Blueberry very heavily browsed.   |
| J.Baictal<br><br><br><br><br><br><br><br><br><br>T.Fifield<br>10.28/96  | GEOLOGY/MINERALS: Unit is underlain by minor amount of carbonate interbedded with phyllite. Forest geologist visited southern half of unit. Low to moderate vulnerability karst found. No significant karst resources described by other resource specialists. Partial suspension is required.<br><br><br><br><br><br><br><br><br><br>LANDS:<br><br><br><br><br><br><br><br><br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br><br><br><br><br><br><br><br><br>VISUALS:  |
| G.Lawton<br>12/97   | PREScription: Partial suspension required for forested wetlands and McGilvery. Shovel yarding per requirements BMP 13.9. Type D clearcut. May be too wet for shovel yarding.  |

# Chasino Study Area Interim Layout N01 Unit 679-392

Mapscale 1:7920 (8 inch = 1 mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Korst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 679-403      ACRES: 71      VOL: 3195      MBF ALTERNATIVES: 4, 6

PHOTO YR/#: '71(51)-1472-43      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G. Lawton<br>12/97   | SILVICULTURE/TIMBER: 67902-138, 67902-143. low windthrow risk. Unit changed to provide proportionality of volume classes. Productivity of site is high. Greenup of adjacent unit should be attained by harvest. Could retain wildlife structure for corridor. 90% hemlock.   |
| J. Oien 5/96   | ROADS: Because of karst development within the unit, road construction should minimize clearing limits and disturbance during construction. Road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to the alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be approved by both the Forest Geologist and the District Fisheries Staff.   |
| R. Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 3D (Vixen - Traitors 35-60%). No concerns apparent, but McGilvery and Marble karst reported by geologist require partial suspension (BMPs 13.9, 13.16; TLMP 1997). Field review recommended during layout for soils concerns (BMP 13.2; TLMP 1997). Unit is in third order watershed 000z, which will have about 32% cumulative effect under alternatives 4 and 6 (BMP 12.1; TLMP 1997).   |
| K. McCartney,<br>J. Frank,<br>D. Kuntzsch<br>7/24/95                         | FISHERIES: No streams in this unit. Unit contains Karst.   |
| M. Pacheco,<br>J. Baichtal<br>7/25/95<br>C. Tighe,<br>A. Mueller,<br>6/20/96 | WILDLIFE:<br><br>Game trails in unit. Karst. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/20/96 Deer beds, pellets, trails and browse seen in unit. Blueberry very heavily browsed.   |
| J. Baichtal<br>10/22/96  | GEOLOGY MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Unit underlain by marble. Sinkholes numerous, none holding water. Even though sinkhole development is widespread and epikarst is moderately well developed, soils tend to be moderately deep, weathered, yellowish-brown silts. Soils seem to be developed as a result of mineralization which has weathered. These deep soils seem prone to windthrow. Based on sinkhole densities unit should be high vulnerability. Based on soil epikarst development unit should be of moderate vulnerability. Because of the lack of discrete karst features taking water, the lack of caves, and the soil development and depth, the unit is proposed for harvest. Partial suspension required within unit as a minimum. Yarding should be perpendicular to the karst ridges when ever possible. Because of the broken nature of the ground, more temporary spurs may be needed to log the unit. It can be expected that 10-20% of the acres of harvest proposed will be deleted to protect discrete karst features. Mitigation to protect such features should be designed during final layout to insure windfirmness of buffers. Unit design should consider windthrow potential. Suggest adopting proposal to access unit by spurring in from the north and south instead of building road through unit.<br><br>LANDS: |
| T. Fifield<br>10/28/96   | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G. Lawton<br>12/97   | PRESCRIPTION: Use type B clearcut. Karst feature protection may make yarding challenging. More soil scarification will assure spruce regeneration.   |

# Chasina Study Area Interim Layout N01 Unit 679-403

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-409      ACRES: 80      VOL: 1800      MBF      ALTERNATIVES: 3, 4, 5, 6

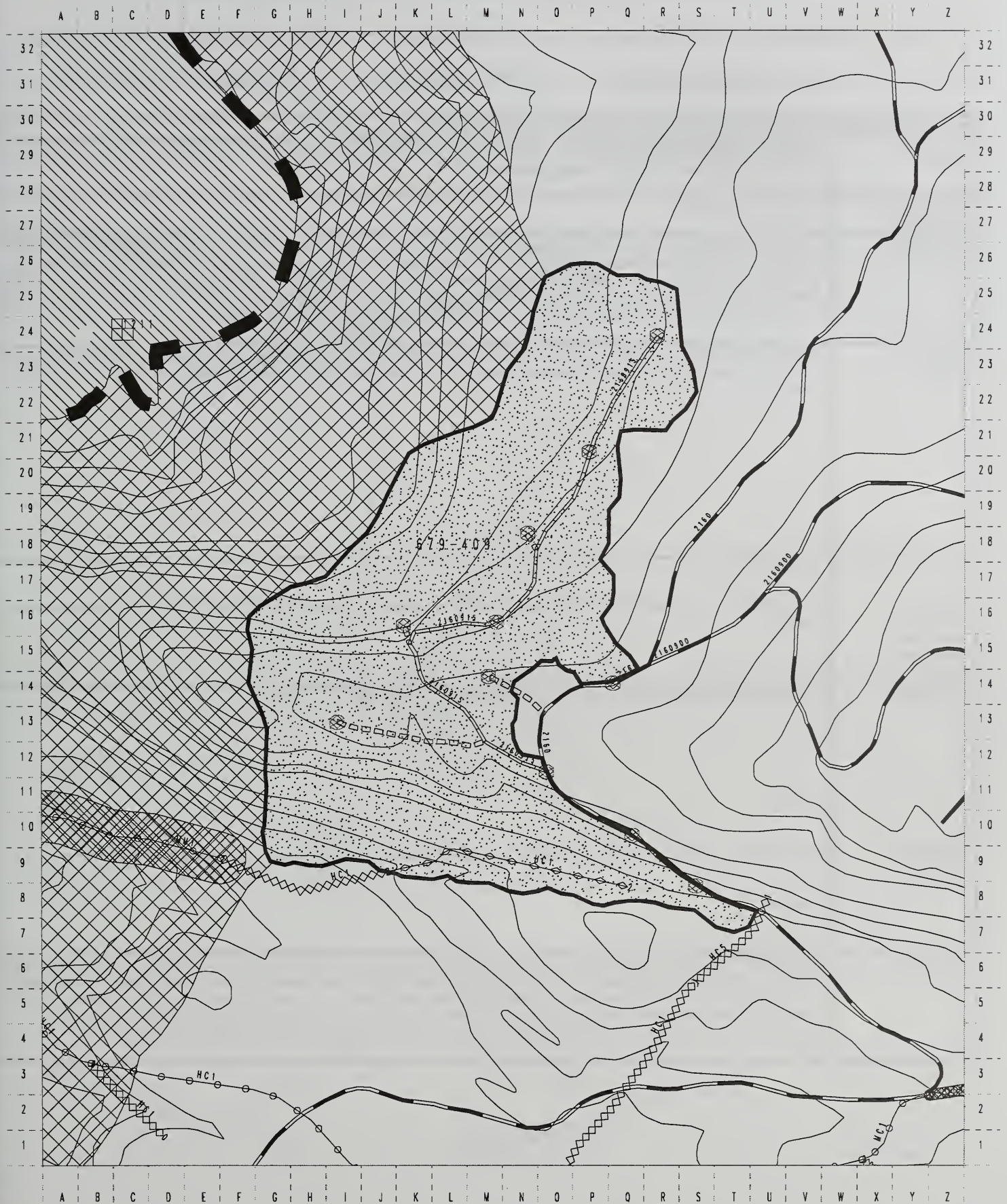
PHOTO YR/#: '71(51)-1472-43      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: RS,LS,SL

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G. Lawton<br>12/97   | SILVICULTURE/TIMBER: 67902-132, high windthrow risk, minor portion downhill yarded. Unit changed to provide proportionality of volume classes. Retain stand structure for wildlife where feasible. Productivity of site is high. Adjacent to previous cuts. Should meet greenup requirements. Adjacent recent salvage sale. Stay out of estuary buffer. High mistletoe content.  |
| J. Oien 5/96   | ROADS: Because of karst development within the unit, road construction should minimize clearing limits and disturbance during construction. Road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to the alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be approved by both the Forest Geologist and the District Fisheries Staff.   |
| Field<br>D.J.Landwehr<br>10/13/95<br>EIS R.Johnson   | SOILS/WATERSHED: Minimum of partial suspension throughout unit (BMPs 13.9, 13.5; TLMP 1997)). Full suspension is recommended on south facing slope in the southwest portion of the unit (BMPs 13.9, 13.5). Green and white protection on stream on east boundary (BMP 13.16). Orange and white protection for large stream on south boundary (BMP 13.16). Orange and white protection for larger stream on north side of ridge, and green and white for smaller stream on north side of ridge. Design unit to minimize blowdown, which is especially likely to occur on karst. Third order watershed 000Z. Additional information is filed in the reconnaissance folder.   |
| M.Driscoll<br>8/97   | FISHERIES: Stream 1 is a class III orange/ white, the stream is outside the unit boundary. Stream 2 is a class II orange/ white that requires a 120' AHMU buffer, this is outside the unit boundary (BMP 12.6). Stream 2 is a class III orange/ white, this is outside the unit boundary. In side the unit stream 2 is a class IV green/ white.<br>The orange/ white streams requires directional falling and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16).   |
| M.Pacheco,<br>J.Baichtal<br>7/26/95<br>D.Parker,<br>M.Pacheco,<br>B.Johnston<br>8/16/95<br>M.Dillman, A.<br>Mueller, 6/1/96<br>B.Johnston, A.<br>Mueller 6/6/96<br>T.Belfield 7/96 | WILDLIFE:<br><br>Deer signs and game trails in area. Wolf killed deer found. Also marbled murrelet eggshell fragments were found near the units western boundary. Karst throughout unit. Unit identified as important travel corridor. Partial harvest is recommended to maintain forest structure and lessen impact on wildlife migration and dispersal. Unit is within a half mile of known bald eagle nest. Road construction must be accomplished in accordance with the requirements of the Bald Eagle Protection Act and written coordination with the U.S. Fish and Wildlife Service must be documented. Any road construction must also comply with the MOU between the U.S. Fish and Wildlife Service and the U.S. Forest Service. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. A marbled murrelet dusk and dawn survey was done from the Lancaster cabin. No birds were recorded. A sensitive plant survey was done by the botanist in this unit but no sensitive plants were found. Maintain 1000 foot estuary buffer. |
| J.Baichtal<br>5/15/96  | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Unit underlain by marble. Moderately well developed epikarst on top of ridge, thin shallow soils. Moderate vulnerability karst throughout unit. Partial suspension required within unit as a minimum.<br><br>LANDS:  |
| T. Fifield 5/96  | CULTURAL: This unit was surveyed in 1996 to determine if historic materials associated with the Gladstone Prospect are located in or near the unit. No cultural materials were noted. There are no concerns with this unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97<br>D.J.L., R.J. 10/95  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 5-10% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Dropped 5 acres south side - no tailholds (low volume). Monitor for potential spruce planting. Release treatment possible for mistletoe. PCT at 15 years.   |



# Chosina Study Area Interim Layout N01 Unit 679-409

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

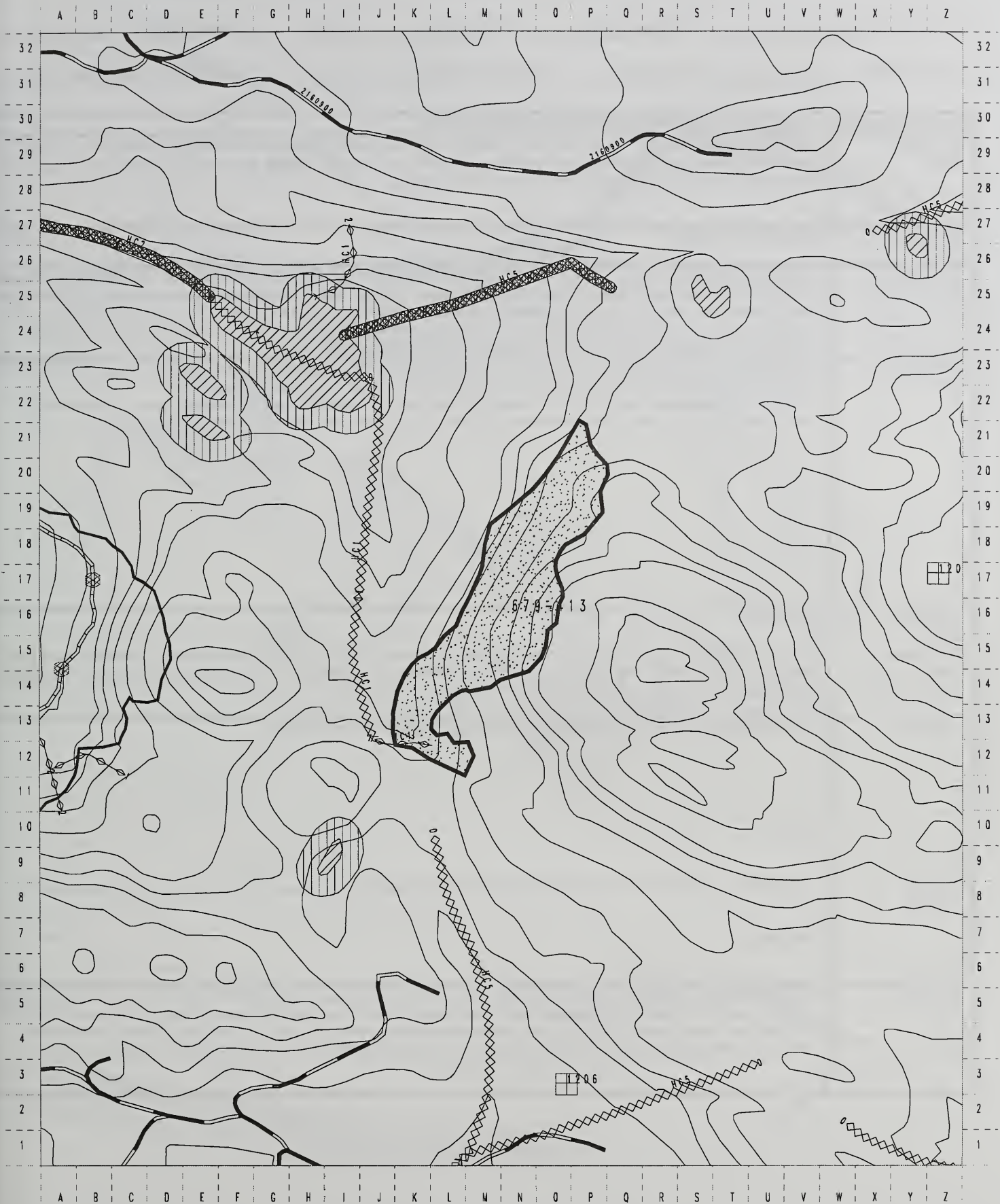
VCU-UNIT#: 679-413      ACRES: 13      VOL: 156      MBF      ALTERNATIVES: 2, 3, 4, 5, 6

PHOTO YR/#: '71(51)-1472-42/'91-390-163      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G. Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-125, low windthrow risk. Productivity of site is low. Uneconomic, low volume area surrounding. Field checked alternative regeneration methods.  |
| J. Oien 5/96  | ROADS: No concerns.  |
| R. Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped primarily 74E (Kupreanof 60-75%), with 4D (Helm 35-60%), 86CD (Kaikli - Grindall 5-60%), 244CD (Hydaburg-Grindell 5-60%0 and 48C (Helm-Kitkun 5-35%). Partial suspension for forested wetlands and slopes (FSM 2554; BMPs 12.5, 13.5, 13.9). May need slope break buffer on stream and V-notch on southwest side of unit. May need field review during layout because of potential unstable soils and rock outcrops (BMPs 13.2, 13.5). Additional information is filed in the reconnaissance folder. Minor amounts of Kaikli and Kitkun soils present (TLMP 1997).   |
| J. Bauers<br>8/97   | FISHERIES: Stream 1 is a class IV green/ white that requires directional falling and split yarding(where practical) or partial suspension. Clean class IV streams of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16).  |
| M.Pacheco<br>7/26/95<br>A.Mueller,<br>B.Johnston<br>7/20/96 | WILDLIFE:<br><br>Deer and bear sign in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density.   |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                                       | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G. Lawton<br>12/97  | PRESCRIPTION: Clear-cut w/ reserves: retain 5% of cutting unit where fesaible and safe. Areas should be in clumps or patches, buffers or blind-leads, and dispersed. Type clearcut w/reserves. Band of small timber to be left along boundary for cedar seed supply. Mitigation for soils protection: drop cliffs out of unit - results in narrow unit, helicopter yard, full suspension, cedar seed trees left on entire perimeter. Overstory removal with 18" DBH limit is option. Reserve trees for wildlife structure available in perimeter because smaller unit anticipated in layout process. Monitor for possible YC planting. PCT in 25+ years. |

# Chosino Study Area Interim Layout N01 Unit 679-413

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

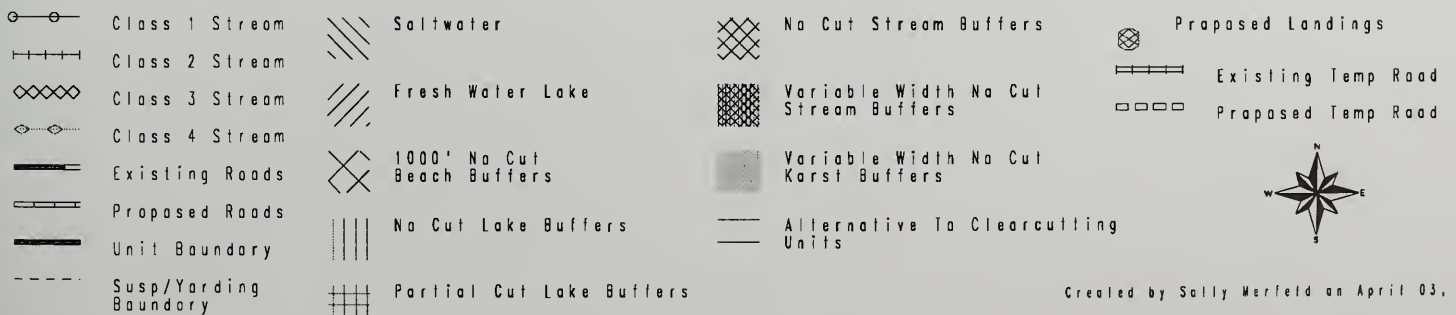
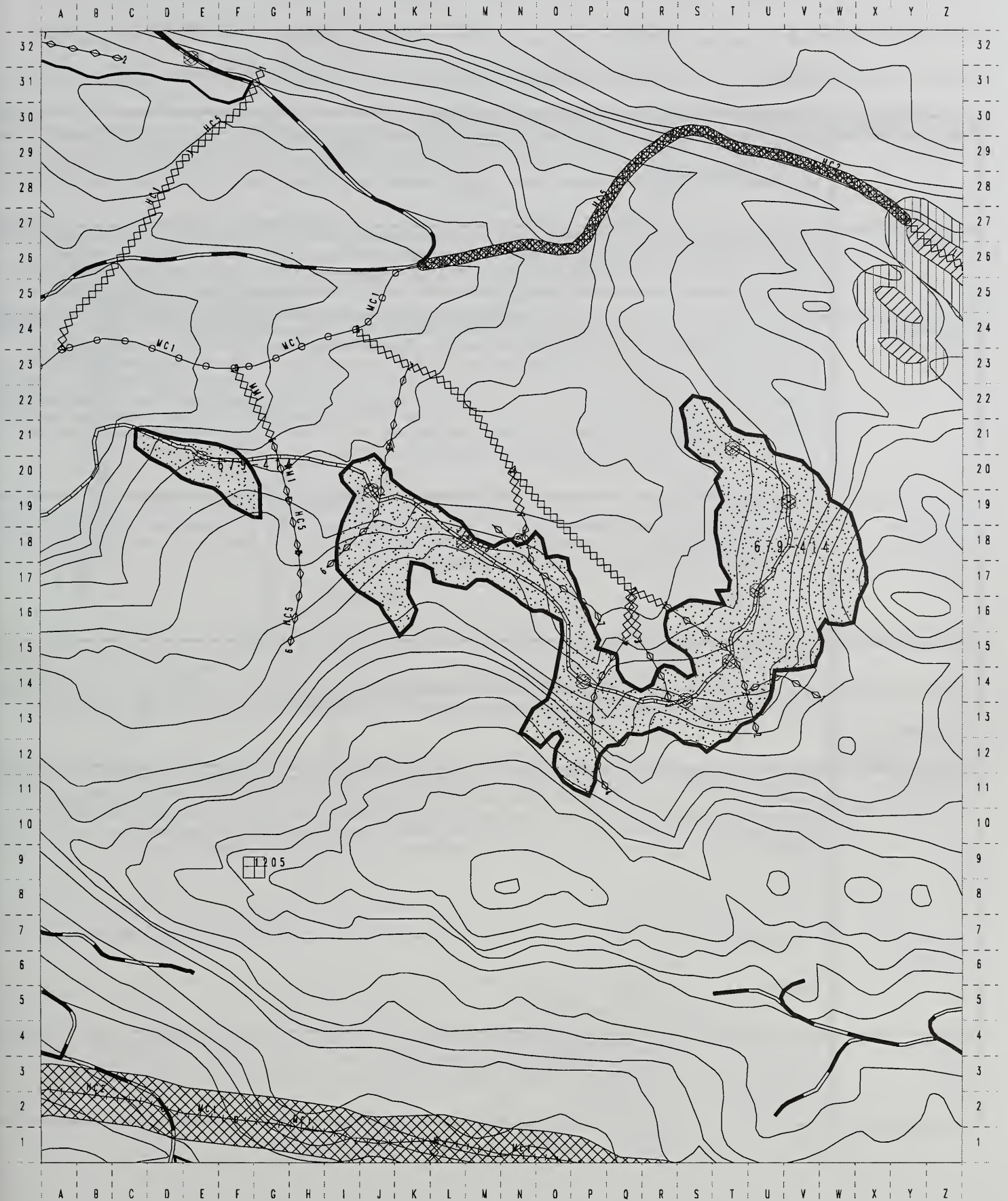
VCU-UNIT#: 679-414      ACRES: 37      VOL: 527      MBF      ALTERNATIVES: 2, 3, 4, 5, 6

PHOTO YR/#: '71(51)-1472-42/'91-390-163 1/4 QUAD: CRG A-1 NE 1/4 LOGGING SYSTEMS: RS

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G. Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-103, low windthrow risk, portion downhill yarded. Productivity of site is low. Uneconomic, low volume area to north and between western area settings. Downhill yarding shortens road (more feasible - slopes). Retain cedar component through planting and/or seed trees remaining.  |
| J. Oien 5/96  | ROADS: No concerns.  |
| R. Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped primarily 48C (Helm - Kitkun 5-35%) and 57D (Petrel 35-60%), with 3D (Vixon - Traitors 35-60%), 33D (StNicholas - McGilvery 35-60%), 86CD Kaikli-Grindell 5-60%). Unit basically forested wetland. Minimum partial suspension for wetlands, inclusions of MMI3, and McGilvery (BMPs 12.5, 13.9; TLMP 19917. Unit includes muskeg areas, in addition to low volume areas already deleted, that should be avoided (BMP 12.5). See fisheries for protection of streams (BMP 13.16). Minor amounts of Kaikli and Kitkun soils present (TLMP 1997). |
| J. Bauers<br>8/97   | FISHERIES: Stream 1 is a class IV green/ white. Stream 2 is a class IV green/ white. Stream 3 is a class IV green/ white. Stream 4 is a class IV green/ white. Stream 5 is a class IV green/ white. Stream 7 is a class IV green/white. The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16).   |
| M.Pacheco<br>6/28/95<br>M.Dillman, A.<br>Mueller 5/31/96<br>T.Belfield 7/96 | WILDLIFE:<br><br>Game trails and bear scat seen in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 5/31/96 Deer sign seen in unit. This unit was surveyed by the botanist and sensitive plants ( <u>Platanthera chorisiana</u> ), choris bog-orchids, were found in the vicinity.  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G. Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 5% of cutting unit(along edge), where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut, leave up to 20" DBH seed trees on edges of unit for cedar seed source in this anticipated narrow unit. Minimum of partial suspension required. Protect muskeg areas included in unit. Presale needs to consider the many stream segments for mitigation.   |

# Chosina Study Area Interim Layout N01 Unit 679-414

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

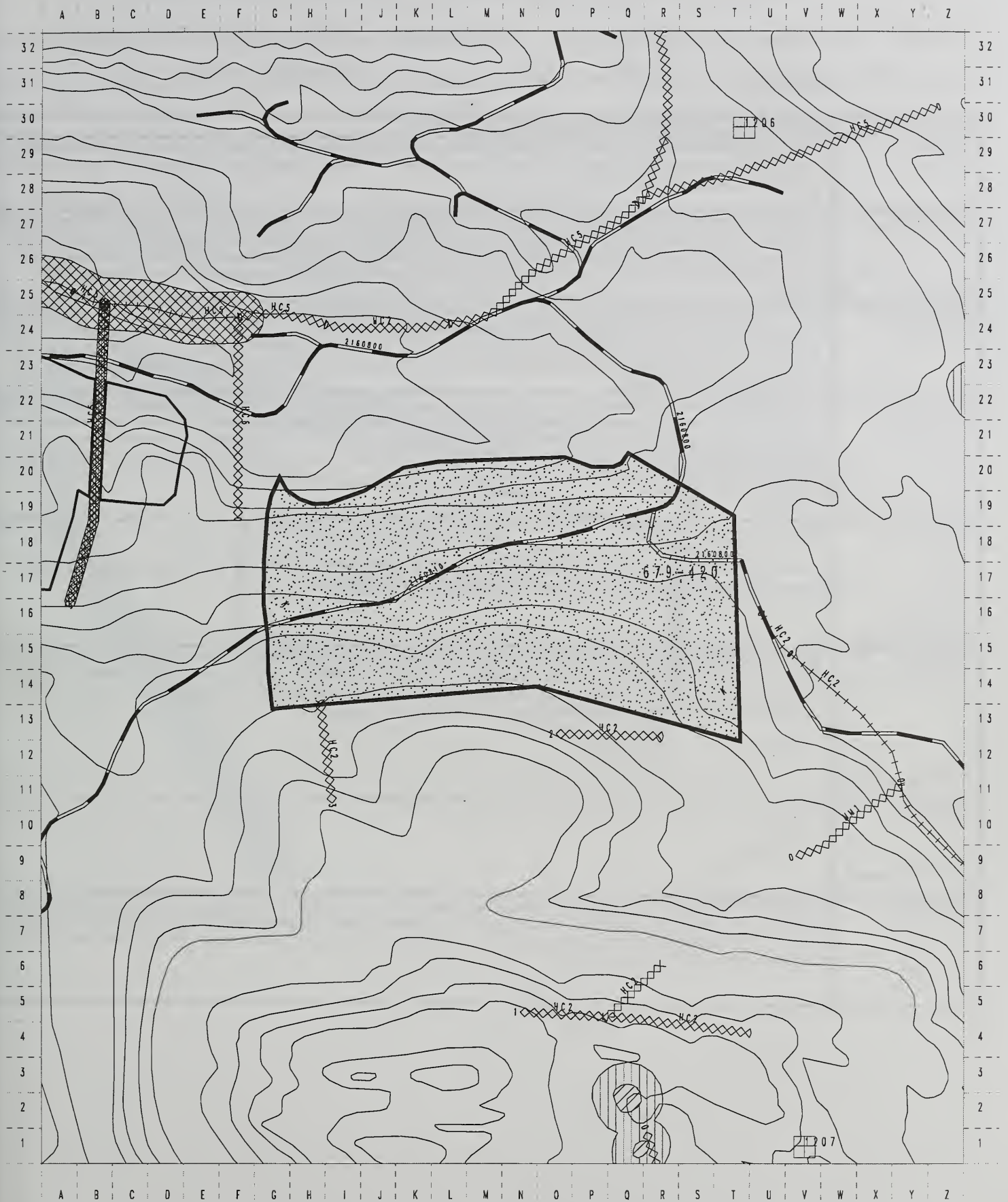
VCU-UNIT#: 679-420      ACRES: 53      VOL: 2650      MBF      ALTERNATIVES: 2,4,5,6

PHOTO YR/#: '91-390-163      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: SL

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67902-035, high windthrow risk. Unit changed to provide proportionality of volume classes. Productivity of site is high. Major karst fault to the south. Adjacent to native clear-cut. Unit design calls for clear-cut regeneration method. DROPPED unevenaged mgmt. Potential due to v. high windthrow hazard. May need spur roads to reach SE corner.  |
| J. Oien 5/96  | ROADS: Because of karst development within the unit, road construction should minimize clearing limits and disturbance during construction. Road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to the alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be approved by both the Forest Geologist and the District Fisheries Staff.  |
| R. Johnson<br>6/15/95   | SOILS/WATERSHED: Soils remaining unit mix Tolstoi, Traitors, Tokeen, Sarkar, Ulloa, McGilvery, Kitkun, Kaikli, St.Nicholas. Slopes up to and greater than 75%, though generally less than 55%. Partial suspension for moderate vulnerability karst and McGilvery (BMP 13.9; TLMP 1997). Deleted from top of W to E ridge (about 15-16 on unit card) to proposed S boundary because blind lead top of ridge, high vulnerability karst, primarily McGilvery beyond ridge, and MMI4 forested wetland on steep slopes upper backline (BMPs 12.5, 13.9, 13.5, 13.6; TLMP 1997). <u>Need to delete NW corner adjacent clear-cut due steep slopes, karst, McGilvery and resurgence (BMPs 13.5, 13.9, 13.16; TLMP 1997). Other resurgences N. boundary need protection (BMP 13.16). In third order watersheds H54A and H63A, which will have about 59% and 53% (to 54%), cumulative effects respectively, under alternatives 2,4,5 and 6 (BMP 12.1; TLMP 1997). Defer harvest on Kaikli and Kitkun soils (TLMP 1997).</u> |
| J. Frank,<br>J. Baichtal,<br>D. Kuntzsch,<br>J. Wrate,<br>6/15/95             | FISHERIES: Stream 1 is a class III green/ white. Stream 2 is a class III green/ white. Stream 3 is a class III green/ white. The class III green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16). There are also karst resurgences below the proposed road that will need split yarding (BMP 13.16).  |
| D.Parker, J.Wrate<br>6/15/95<br>C.Tighe,<br>B.Johnston, A.<br>Mueller 5/16/96 | WILDLIFE:<br><br>Deer browse, pellets, trails and beds seen throughout unit. Many karst features found. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Large diameter tall snags in unit- great wildlife trees.  |
| J.Baichtal<br>5/15/96   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Unit on interbedded marble and phyllite. Southern 2/3 of unit is high vulnerability karst based on epikarst development, frequency of large collapse features and insurgences. This portion of the unit was excluded from the unit as per the standards and guidelines outlined in the RSDEIS for the TLMP. The northern 1/3 of the unit is on moderate vulnerability karst with resurgences along the northern limit of the unit. Design the unit to exclude the resurgences and partially suspend logs on the remainder of the unit.  |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: This unit was surveyed in 1996. No cultural resources were noted. There are no concerns with the unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>5/96<br>2/97<br>12/97   | PRESCRIPTION: <u>Clear-cut w. no reserves</u> ; retain 0% of cutting unit; major windthrow potential. Partial suspension required. Delete NW corner. Spur to upper end (south) of unit, connection to private road to the east. Spur to upper (south) end of unit, connections to private road to the east. DROPPED FROM PREFERRED ALTERNATIVE DUE TO WATERSHED CUMULATIVE EFFECTS. PCT AT 15 YEARS.  |

# Chosina Study Area Interim Layout N01 Unit 679-420

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

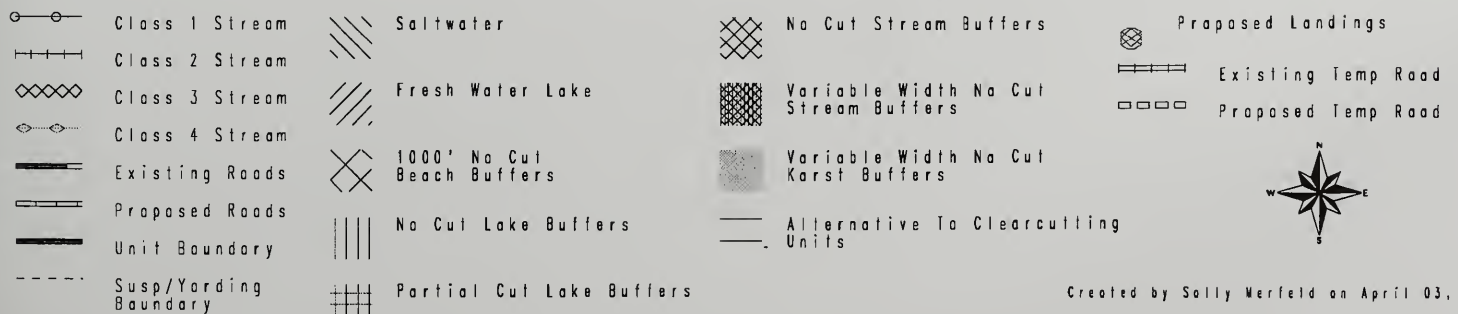
VCU-UNIT#: 679-422      ACRES: 46      VOL: 1840      MBF      ALTERNATIVES: 2, 4, 5, 6

PHOTO YR #: '91-390-163      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: RS

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-035, high windthrow risk. Productivity of site is high. Split-yarding required on stream. Maintain setting width between units. Uneconomic, low volume area to south. Extend spur to western edge of unit for good suspension. Add eastern setting to stream.  |
| J. Oien 5/96   | ROADS: Because of karst development within the unit, road construction should minimize clearing limits and disturbance during construction. Road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to the alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be approved by both the Forest Geologist and the District Fisheries Staff.  |
| R.Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped primarily 3D (Vixen - Traitors 35-60%), with 48C (Helm - Kitkun 5-35%) on S boundary. Karst reported in unit. Partial suspension for karst and forest wetlands (BMPs 12.5, 13.9), although wetlands appear open and low volume not suitable for harvest. Protect cave and streams per geology and fisheries (BMP 13.16). Defer harvest on Kaikli soils (TLMP 1997). Unit is in third order watershed H63A, which will have about 53-54% cumulative effect under alternatives 2, 4, 5 and 6 (BMP 12.1 : TLMP 1997).  |
| M. Becker,<br>K. McCartney,<br>J. Frank,<br>6/15/95  | FISHERIES: Stream 1 is a class III green/ white. Stream 2 is a class III orange/ white. Stream 3 is a class III orange/ white that requires a slope break plus 25' buffer (BMP 13.16). The class III orange/ white streams require directional falling, and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The class III green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). Recommend keeping unit boundary above road (BMP 12.6, 13.16). |
| D.Parker,<br>C.Tighe,<br>J.Wrate<br>6/15/95<br>C.Tighe,<br>B.Johnston, A.<br>Mueller 5/16/96 | WILDLIFE:<br><br>Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Orange and pink mining flagging and stakes with yellow and pink flagging seen throughout unit.   |
| J.Baichtal<br>5/15/96  | GEOLOGY MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Unit is underlain by interbedded phyllite and marble. Unit is on moderated vulnerability karst except for cave system located in western 1/3 of unit. A 100 foot no harvest buffer is required around the cave and stream feeding into cave as per the standards and guidelines outlined in the RSDEIS for the TLMP. Partial suspension required on remainder of unit.<br><br>LANDS:  |
| T.Fifield<br>10/28/96  | CULTURAL: This unit was surveyed in 1996. No cultural materials were noted. There are no concerns with the unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 0% of cutting unit, where feasible and safe. Reserves are unmerchantable and snags due to high WT risk.. Use type A clear-cut. Partial suspension required. <b>DROPPED FROM PREFERRED ALTERNATIVE DUE TO WATERSHED CUMULATIVE EFFECTS.</b> Could drop portion north of existing road for stream protection (mapping of stream to the north needs field verification). PCT at 20 years.  |

# Chasino Study Area Interim Layout NOI Unit 679-422

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

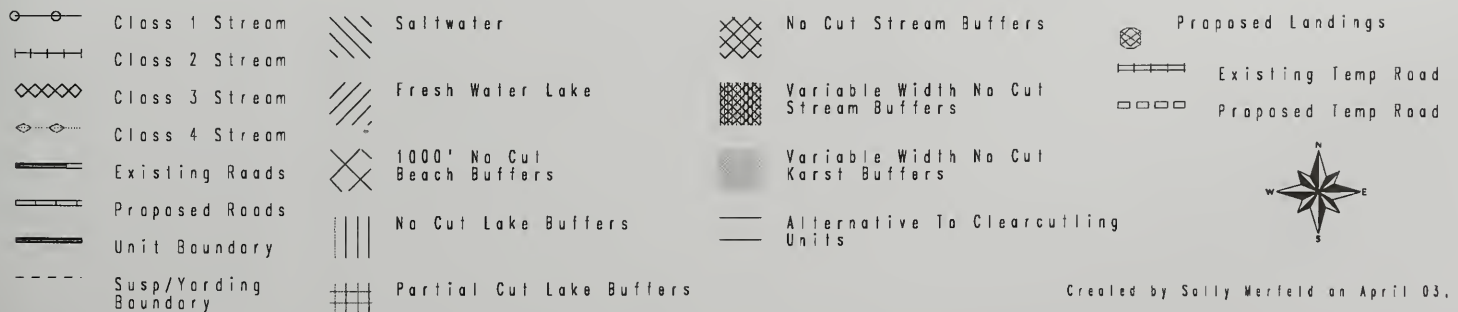
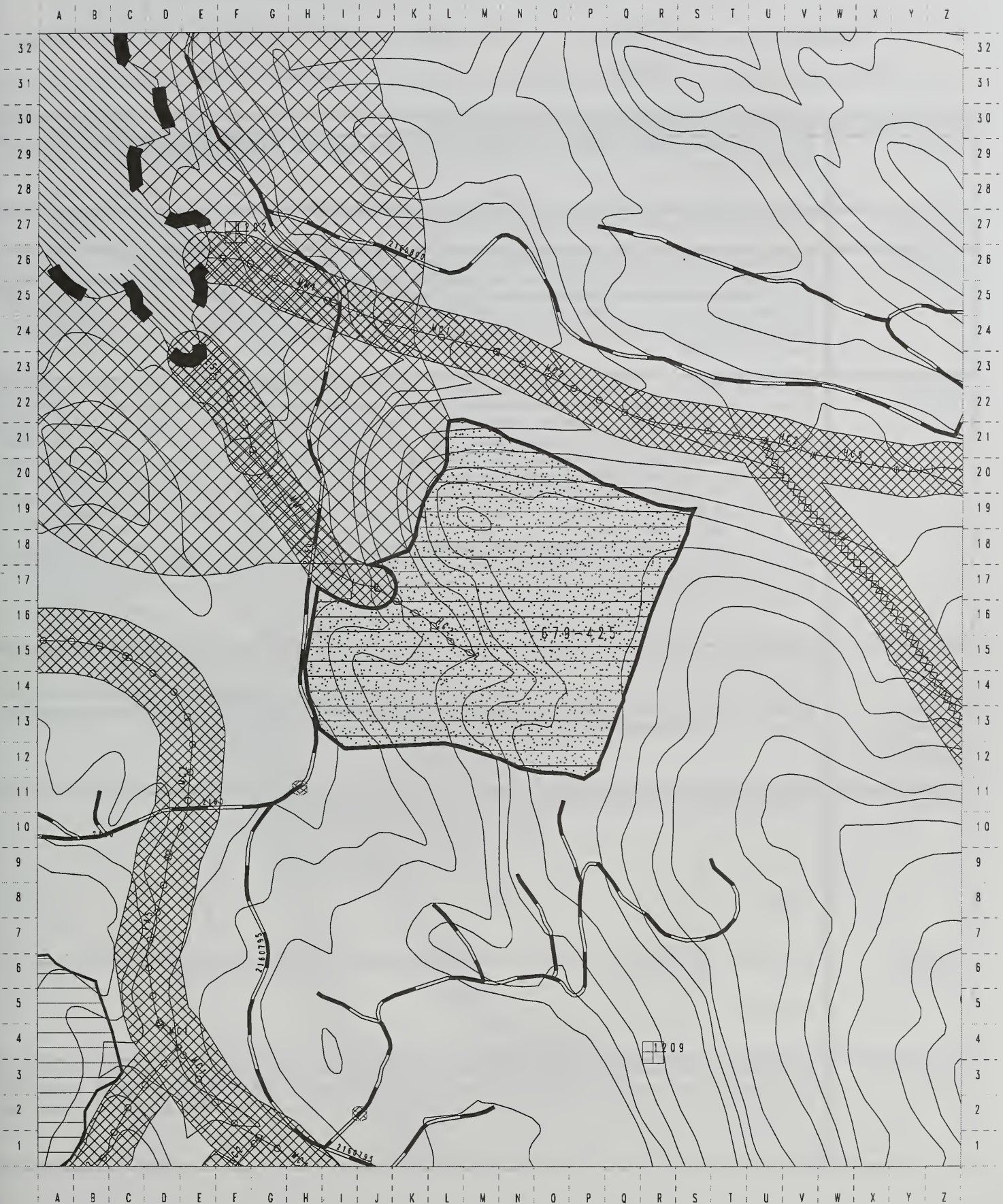
VCU-UNIT#: 679-425      ACRES: 42      VOL: 1134      MBF ALTERNATIVES: 3, 4, 6

PHOTO YR/#: '91-390-163      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-035, high windthrow risk, portion downhill yarded. Retain stand structure for wildlife where feasible. Eliminate cut in various buffers. Field checked alternative regeneration methods. Maintain setting width between units. Productivity of site is moderate. Check option of unevenaged mgmt / OSR. East side deferred for wildlife corridor and watershed concerns. Spur road preference would come from the east to access deferred area in the future.  |
| J. Oien 5/96   | ROADS: No concerns.   |
| R.Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped 3D (Vixen - Traitors 35-60%) N 2/3 of unit; 32C (StNicholas - McGilvery 5-35%), and 13 (SaltChuck 0-10%) S 1/3 of unit. Partial suspension for forested wetlands, and McGilvery (BMPs 12.5, 13.9; TLMP 1997). Stream and V-notch on N boundary probably needs a slope break buffer (BMP 12.6a). Protection of streams per fisheries (BMPs 13.16, 12.6, 12.6a). North portion of unit in third order watershed H63A; south end of unit in third order watershed H62A. Unit will be in ATC study.                     |
| M. Driscoll<br>8/97  | FISHERIES: Stream 1 is a class II blue/white TTRA that flows along the north boundary of the unit; it requires a slope break plus 100' buffer (BMP 12.6). Stream 2 is a class I blue/ white that requires a 100' TTRA buffer, inside the unit stream 2 is a class IV green/ white.<br>The green/white streams require directional falling, and split yarding (where practical) or partial suspension. Clean these streams before the end of the operating period or before the yarder leaves the area (BMP 13.16, 12.6a).                         |
| M.Dillman,<br>J.Wrate<br>7/12/95<br>C.Tighe,<br>B.Johnston, A.<br>Mueller 5/16-<br>17/96 | WILDLIFE:<br><br>Deer sign seen in unit. Unit identified as an important travel corridor. Partial harvest is recommended to maintain forest structure and lessen impact on wildlife migration and dispersal. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Two different trap lines were set up this unit to catch Prince of Wales flying squirrels. We were unsuccessful. Maintain 1000 foot estuary buffer.   |
| J.Baichtal<br>5/15/96<br><br><br>T.Fifield<br>10/28/96                                   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Soils reported moderate vulnerability karst along southern unit boundary. Partial suspension required over top of karst. Unit not visited by Forest Geologist.<br><br>LANDS:<br><br>CULTURAL: This unit was surveyed in 1996. No cultural resources were noted. There are no concerns with the unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: Overstory removal cut maintain 75% of BA. Uneven-aged amnagement bt ITMAreas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Partial suspension required. Stay off of steep slopes to the west. Deferred (original unit 110 acres) eastern half of unit for watershed impacts. Stay out of V-notch lip to the north. Part of ATC study. See prescription for detailed instructions (treatment #4). Additional 25% removed in 30-40 years. Monitor ATC study. |

# Chosino Study Area Interim Layout NOI Unit 679-425

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

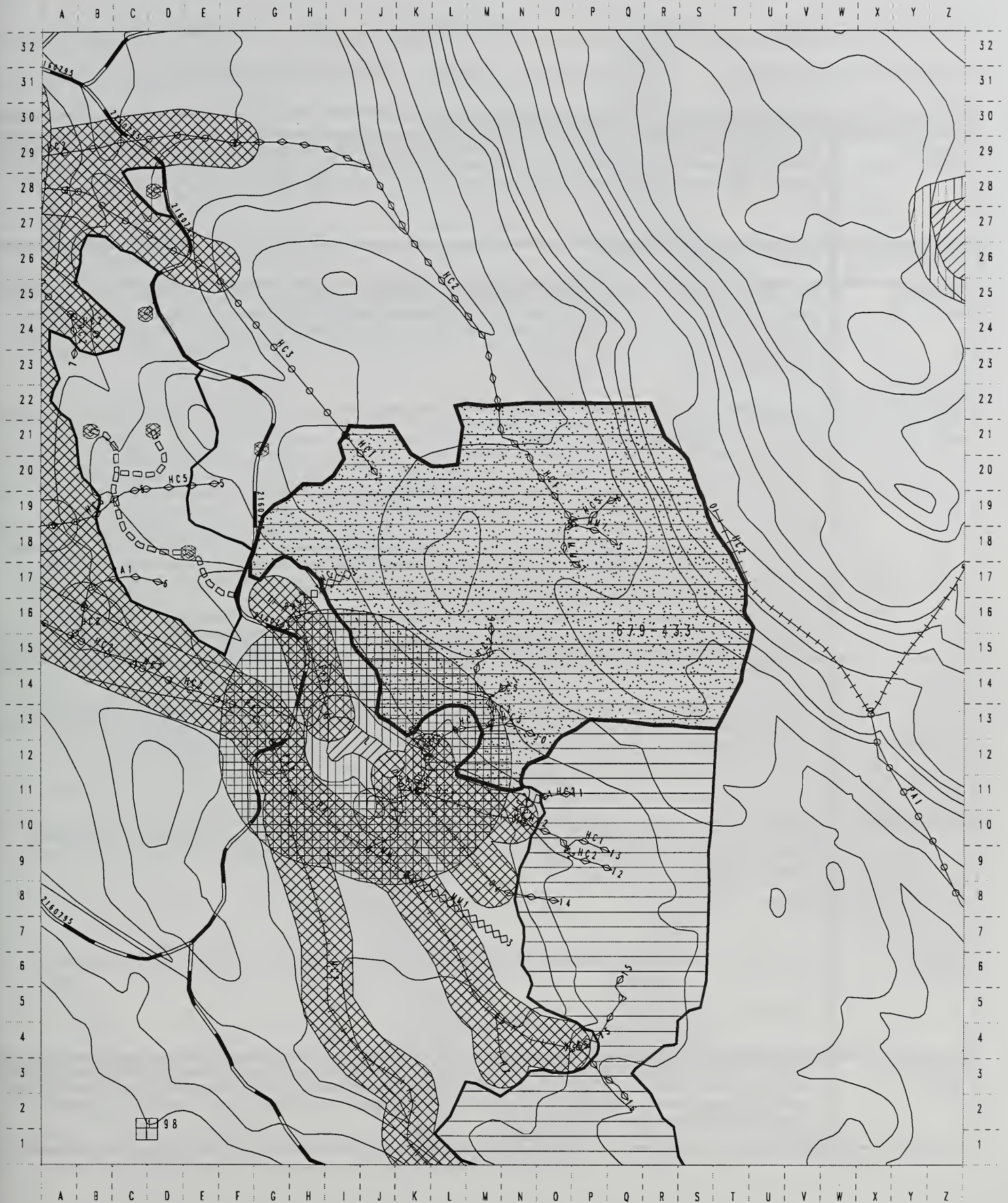
VCU-UNIT#: 679-433      ACRES: 62      VOL: 1204      MBF      ALTERNATIVES: 2,3,4,5,6

PHOTO YR/#: '91-390-165      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67902-83, low windthrow risk. Productivity of site is high. <u>Partial cut buffer</u> . Maintain setting width between units.  |
| J. Oien 5/96  | ROADS: Evaluate temporary roads for specified road criteria.  |
| R. Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped primarily as 1C (Vixen 5-35%), with 550C (StNicholas - Kaikli 5-35%), 442D (Ulloa - Sarkar 35-60%), 4C (Helm 5-35%). Karst was not found by the geologist. Partial suspension for forested wetlands (BMPs 12.5, 13.9). Probable adjustments to unit boundaries due to low volume wetlands, particularly on the E and S. Probable cliffs in NW corner that will need protection. Protection of pond in SW corner and streams in unit per fisheries (BMPs 12.6, 12.6a, 13.16). Unit in third order watersheds H62A and H54A. Minor amounts of Kaikli soils present (TLMP1997). Unit will be helicopter yarded in ATC study.   |
| G. Pierce<br>8/97   | FISHERIES: Stream 1 is a class II blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 2 is a class IV green/ white. Stream 5 was a class III orange/ white, under the new TLMP (1997) standards stream 5 is a class IV orange/ white that changes to class IV green/ white. The lower section of stream 5 is flagged orange/ white to provide additional resource protection. Stream 6 is a class IV green/ white. Stream 7 is a class IV green/ white. Stream 8 is a class I blue/ white that requires a 120' TTRA buffer. Stream 9 is a class I blue/ white that requires a 120' TTRA buffer. Stream 9 turn into a class III orange/ white and then to a class IV green/ white at the junction with stream 9b. The class III orange/white section of stream 9 is now classified as a class IV orange/ white under the new TLMP (1997). This section of stream 9 is flagged orange/ white to provide additional resource protection. Stream 9b is a class IV green/ white. Stream 10 is a class IV green/ white. The lake is class II TTRA that requires a 100'/ 400' uneven age cut (BMP 12.6).<br>The orange/ white streams require directional falling and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| M.Dillman,<br>J.Wrate<br>7/13/95<br>C.Tighe,<br>B.Johnston,<br>A.Mueller<br>6/15/96 | WILDLIFE:<br><br>Game trails, beaver ponds with beaver seen at lake on units southern boundary. Common mergansers on lake. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/15/96 This unit has many game trails, deer pellets and beds. Blueberry and skunk cabbage have been browsed. Some bear sign in unit.  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br>LANDS:   |
| T.Fifield<br>10/28/96   | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: Part of ATC study, uneven-aged management, 25% BA retained in various clumps. Drop two acres in center due to unsuitable, uneconomical timber. Put 100' no cut buffer and 400' partial cut buffer around lake to the SW. Monitor ATC study and possible PCT in 20 years. Helicopter yarding only with no roads in unit. See prescription for ATC details (treatment 6).   |

# Chasina Study Area Interim Layout N01 Unit 679-433

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |

Created by Sally Werfeld on April 03, 1998



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-437E      ACRES: 65      VOL: 1780      MBF      ALTERNATIVES: 3,4,5,6

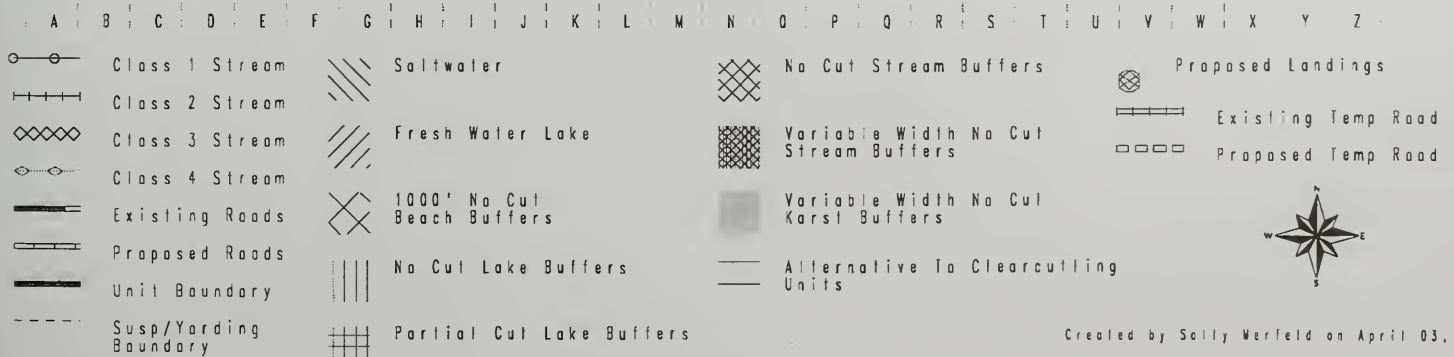
PHOTO YR/#: '91-390-145      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-035, low windthrow risk due to terrain and lack of post evidence. Retain stand structure for wildlife where feasible. Productivity of site is moderate. Maintain setting width between units. Complex streams and protection thereof. Option: unevenaged mgmt. High mistletoe defect in west side. Western half large diameter, eastern half smaller diameter.  |
| J. Oien 5/96   | ROADS: No concerns.  |
| R. Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 550C (StNicholas - Kaikli 5-35%), 62 (Karheen - McGilvery 0-70%), 1C (Vixen 5-35%). Karst, reported by fisheries and geology. Partial suspension because primarily forested wetlands, and includes McGilvery and karst (BMPs 12.5, 13.9; TLMP 1991). See fisheries for stream protection (BMPs 12.6a, 13.16). Minor amounts of Kaikli and Karheen soils present (TLMP 1997). Unit lies in third order watersheds H62A and H61A. Unit expanded by presale following EIS review.   |
| G. Pierce<br>8/97  | FISHERIES: Stream 1 is a class I blue/ white that requires a 200' TTRA buffer due to it's deep V notch channel (BMP 12.6). Stream 2 was a class III orange/ white, under the new TLMP (1997) standards stream 2 is a class IV orange/ white, that becomes a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). The upper section of stream 2 is flagged orange/ white to provide additional resource protection. Stream 3 is a class IV green/ white. Stream 4 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 4 changes to class III orange/ white at 200' of elevation and becomes a class IV green/ white above. The class III orange/ white section of stream 4 is now classified as class IV orange/ white under the new TLMP (1997) standards. This section of stream 4 is flagged orange/ white to provide additional resource protection. Stream 5 is a class IV green/ white that flows into a karst sink hole. Stream 6 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6) inside the unit it is a class III orange/ white that becomes a class IV green/ white at it's headwaters. The class III orange/ white section of stream 6 is now classified as class IV orange/ white under the new TLMP (1997) standards. This section of stream 6 is flagged orange white to provide additional resource protection.<br>The orange/ white streams require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| C.Tighe<br>7/25/95<br>D.Parker,<br>M.Pacheco,<br>B.Johnston<br>8/4/95<br>C.Tighe,<br>B.Johnston, A.<br>Mueller 6/12/96 | WILDLIFE:<br><br>Deer and bear sign seen in unit. Unit identified as important travel corridor. Partial harvest is recommended to maintain forest structure and lessen impact on wildlife migration and dispersal. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Doe seen near unit 6/12/96. Maintain 1000 foot estuary buffer.  |
| J.Baichtal<br>5/15/96  | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Loosing karst stream into large karst collapse along northern unit boundary. Minimum 100 foot no harvest buffer along stream deleting this feature from the unit.<br><br>LANDS:  |
| T.Fifield<br>10/28/96  | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: Dropped 5 acres of scrub in NE corner. Part of ATC study, uneven-aged management. Use various sized group selections to be harvested. Individual trees will also be marked for cutting in the remaining areas. 25% of the BA will be retained totally by the use of these two methods. See prescription for details (treatment 8). Monitor for PCT in 20 years. No further commercial treatments this rotation.  |



# Chosina Study Area Interim Layout NOI Unit 679-437e

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-437W      ACRES: 47      VOL: 1259      MBF      ALTERNATIVES: 3,4,5,6

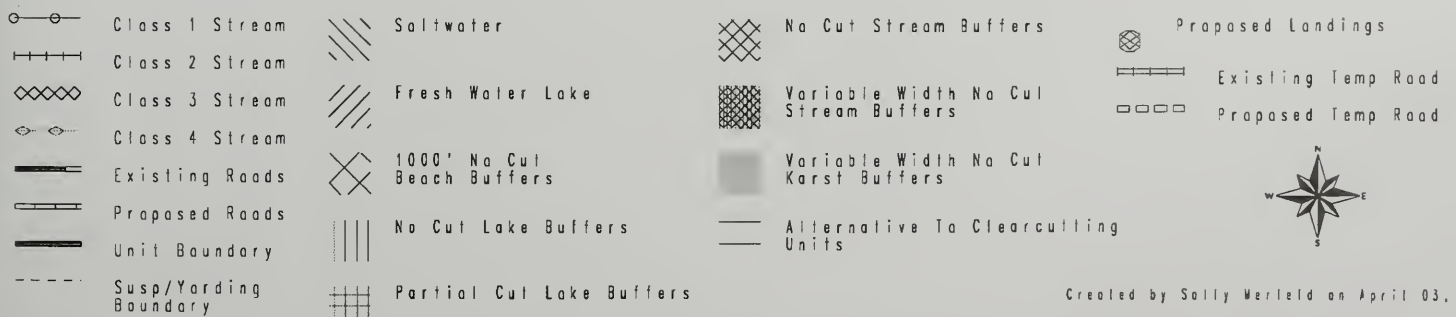
PHOTO YR/#: '91-390-145      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-035, low windthrow risk due to terrAIn and lack of pAst evidence. Retain stand structure for wildlife where feasible. Productivity of site is moderate. Maintain setting width between units. Complex streams and protection thereof. Option: unevenaged mgmt. High mistletoe defect in west side. Western half large diameter, eastern half smaller diameter.  |
| J. Oien 5/96   | ROADS: No concerns.  |
| R. Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 550C (St. Nicholas - Kaikli 5-35%), 62 (Karheen - McGilvery 0-70%), 1C (Vixen 5-35%), 32C (StNicholas 5-35%). Karst reported by fisheries and geology. Partial suspension because primarily forested wetlands, and includes McGilvery and karst (BMPs 12.5, 13.9; TLMP 1997). See fisheries for stream protection (BMPs 12.6a, 13.16). Potential exists to expand unit to N. Minor amounts of Kaikli and Karheen soils present (TLMP 1997). Unit lies in third order watersheds H62A and H61A. |
| G. Pierce<br>8/97  | FISHERIES: Stream 1 is a class I blue/ white that requires a 200' TTRA buffer due to it's deep V notch channel (BMP 12.6). Stream 8 is a class IV green/ white that flows into a Karst sink hole. The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16).   |
| C.Tighe<br>7/25/95<br>D.Parker,<br>M.Pacheco,<br>B.Johnston<br>8/4/95<br>C.Tighe,<br>B.Johnston, A.<br>Mueller 6/12/96 | WILDLIFE:<br><br>Deer and bear sign seen in unit. Unit identified as important travel corridor. Partial harvest is recommended to maintain forest structure and lessen impact on wildlife migration and dispersal. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Doe seen near unit 6/12/96. Maintain 1000 foot estuary buffer.  |
| J.Baichtal<br>5/15/96<br><br><br>T.Fifield<br>10/28/96   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Loosing karst stream into large karst collapse along northern unit boundary. Minimum 100 foot no harvest buffer along stream deleting this feature from the unit.<br><br>LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97  | PRESCRIPTION: Dropped 5 acres of scrub in NE corner. Part of ATC study, uneven-aged management. Use Individual tree marking for structural retention. Retain 25% of the BA. See prescription for details (treatment 3). Monitor for PCT in 20 years. No further commercial treatments this rotation.   |



# Chasina Study Area Interim Layout NOI Unit 679-437w

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

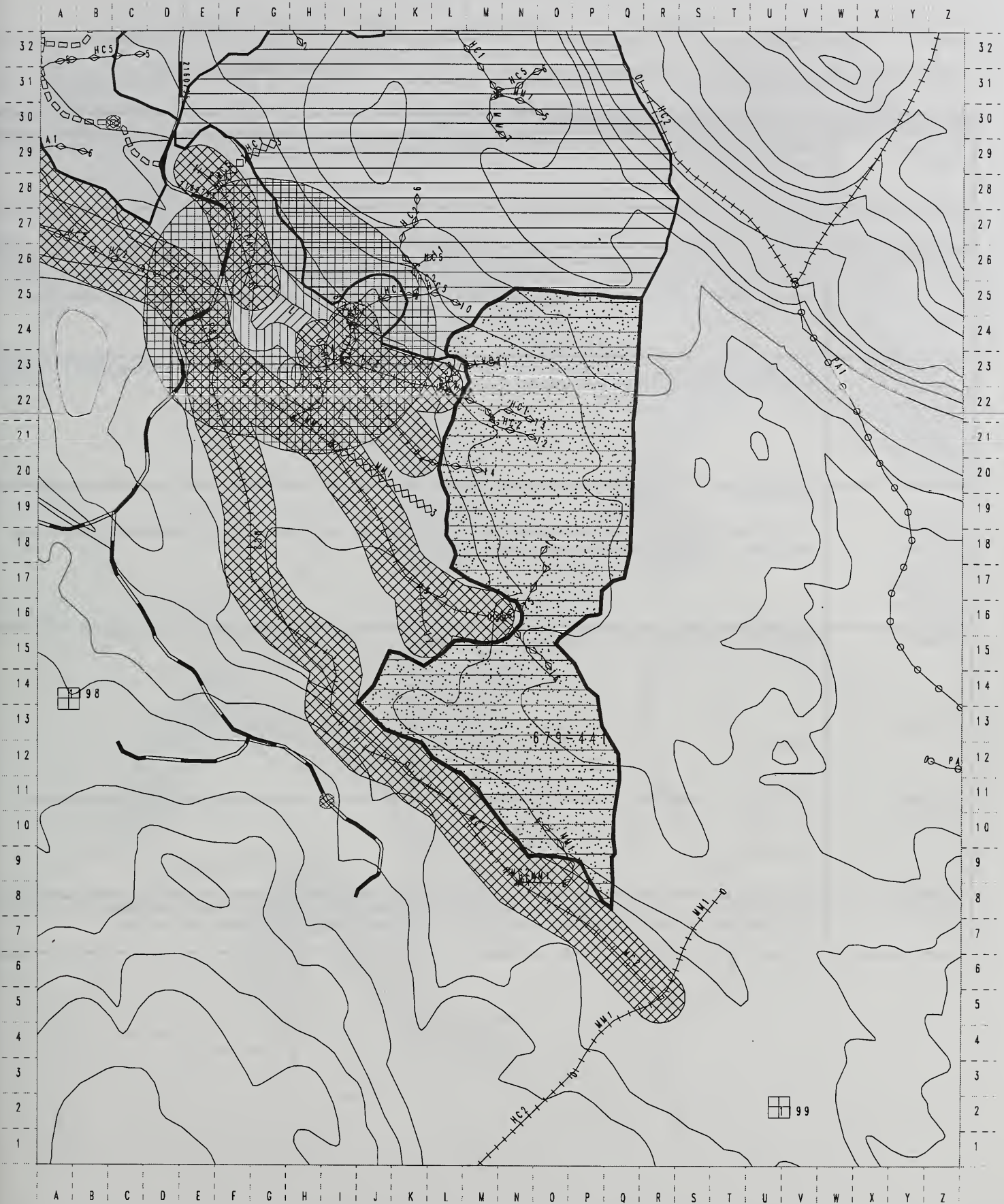
VCU-UNIT#: 679-441      ACRES: 46      VOL: 328      MBF      ALTERNATIVES: 2, 3, 4, 5, 6

PHOTO YR/#: '91-390-165      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67902-077, low windthrow risk. Productivity of site is moderate. PartiField checked alternative regeneration methods.   |
| J. Oien 5/96  | ROADS: No concerns.  |
| R.Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped primarily as 1D (Vixen 35-60%) and 4C (Helm 5-35%) with 1C (Vixen 5-35% and 85(Kina 0-35%). Partial suspension for forested wetlands (BMP 12.5 13.9). Soils of 48C (Helm -Kitkun 5-35%) in SE corner appears to be low volume wetland, and has been deleted (BMP 12.5). Potential to expand unit to SW probably not feasible if class I stream continues. Protection of streams per fisheries (BMPs 12.6a, 13.16). Unit in third order watersheds H62A, and H54A.  |
| G. Pierce<br>8/97   | FISHERIES: Stream 6 is a class II blue/ white that requires a 120' AHMU buffer (BMP 12.6). Stream 11 is a class IV green/ white. Stream 12 is a class II blue/ white that requires a 120' AHMU buffer (BMP 12.6), that turns into a class III orange/ white. Under the new TLMP (1997) standards this section of stream 12 is a class IV orange/ white. This section of stream 12 is flagged orange/ white to provide additional resource protection. Stream 12 it is a class IV green/white at its head waters. Stream 13 is a class IV green/ white. Stream 14 is a class IV green/ white that turns into a class II blue/ white outside the unit boundary. Stream 15 is a class IV green/ white. Stream 16 is a class IV green/ white.<br>The orange/ white streams require directional falling and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| M.Dillman,<br>J.Wrate<br>7/13/95<br>M.Dillman,<br>B.Johnston<br>7/13/96 | WILDLIFE:<br><br>Beaver ponds directly west of NW corner of unit. Deer sighted in muskeg north of unit. Bear signs in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 7/13/96 Bear/game trails throughout unit. This unit has a proposed road connection between private land and Forest Service land in it.   |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97   | PRESCRIPTION: WT outside NE stream buffers at south end are dropped already. Dropped 2 acres - wetland soils. Part of ATC study, uneven-aged management, 75% of the BA will be retained. Various sized group selections will be harvested to achieve this. Additional 25% will be removed in 30-40 years. No further commercial treatments this rotation. Monitor for PCT needs in 20 years. See prescription for ATC for details (treatment 9).   |

# Chasina Study Area Interim Layout N01 Unit 679-441

Mopscle 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

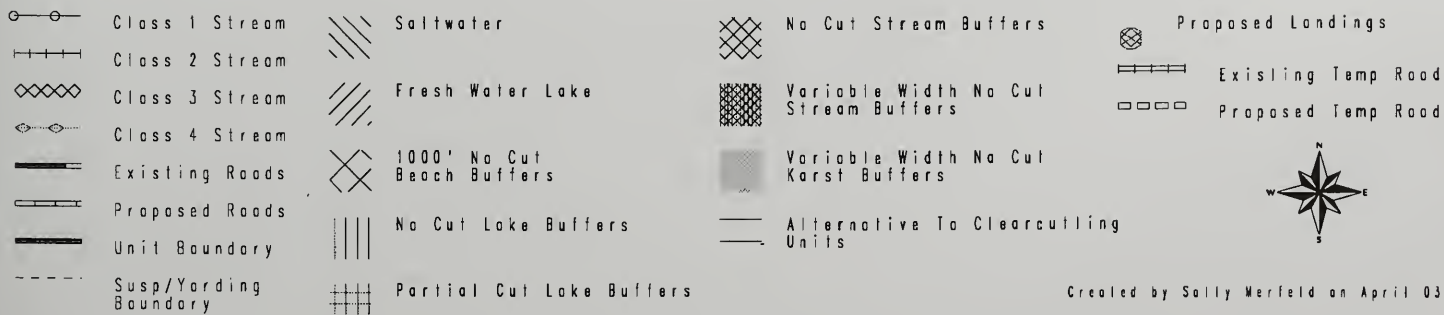
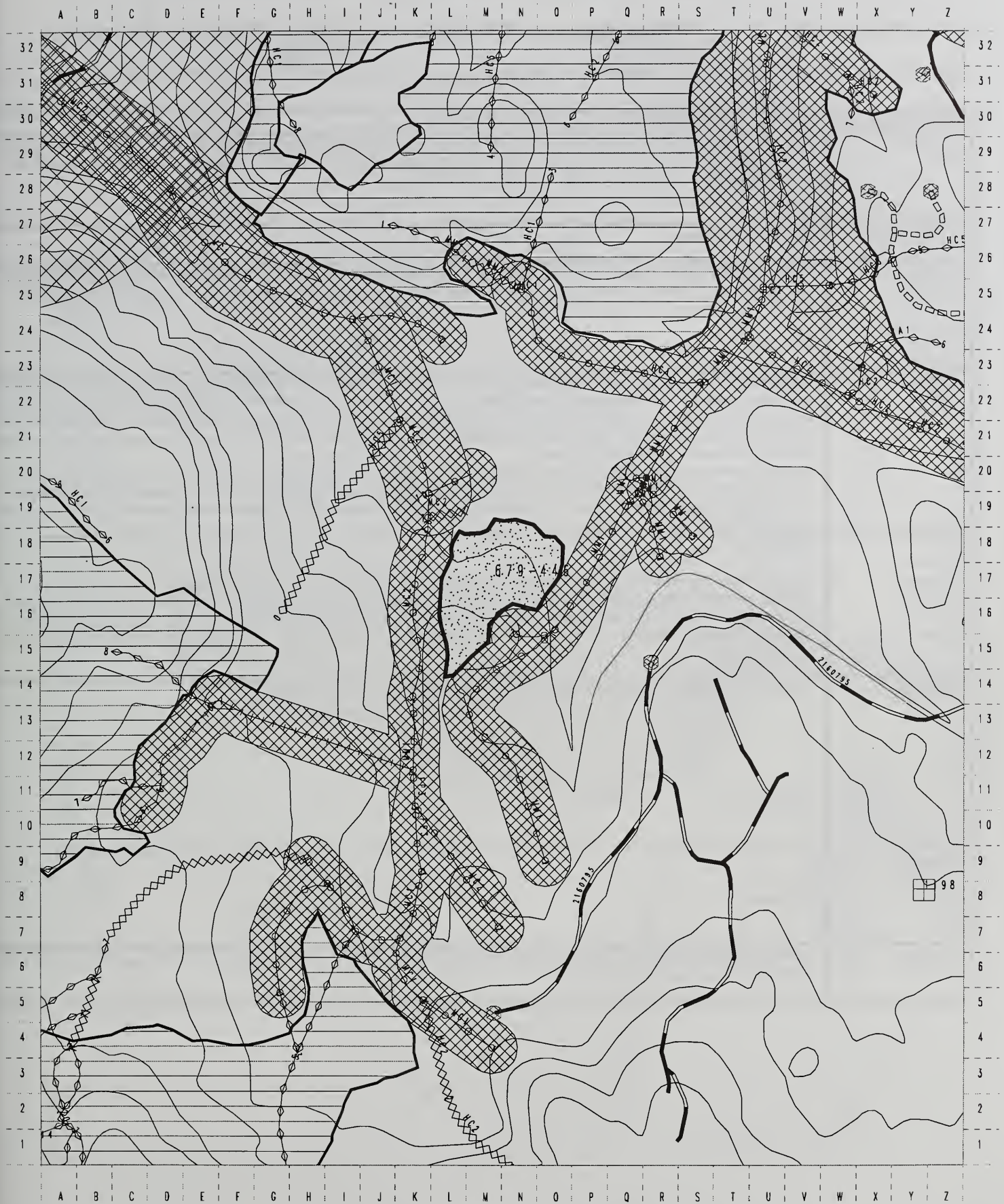
VCU-UNIT#: 679-446      ACRES: 6      VOL: 80      MBF      ALTERNATIVES: 2,3,4,5,6

PHOTO YR/#: '91-390-145      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-061, high windthrow risk, flat ground. Productivity of site is high. Option: unevenaged group selections.  |
|  | ROADS:  |
| R.Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped as 550 C (St. Nicholas - Kaikli 5-35%), and 442 D (Ulloa - Sarkar 35 - 60%). Partial suspension for forested wetlands and karst (BMPs 12.5, 13.9). Deleted low volume in NE. Potential additions in SW and SE corners. Protection of streams per fisheries (BMPs 12.6a, 13.16). Changed to helicopter yarding. Unit lies in watershed H61A. |
| K.McCartney<br>H.Roerick<br>K.Buckley<br>7/21/95<br>J.Bauers<br>8/97                 | FISHERIES: Streams 1, 2, 3, 4, 5, 6, and 10 are class 1 blue/white streams that all require 100' TTRA buffers (BMP 12.6). Beaver ponds near the unit require 100' buffers (BMP 12.6).   |
| D.Parker,<br>M.Pacheco<br>8/11/95<br>C.Tighe,<br>B.Johnston,<br>A.Mueller<br>5/18/96 | WILDLIFE:<br><br>Deer and bear sign common. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 5/18/96 Active beaver ponds found on stream near unit.  |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
|  | LANDS:  |
| T.Fifield<br>10/28/96  | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.  |
|  | VISUALS:  |
| G.Lawton<br>12/97  | PRESCRIPTION: Due to stream complications/buffers, the resulting unit is a small type C clearcut with major buffers. Due to ATC study units in close proximity, 446 can be helicopter yarded with landing on the existing road to the east.   |

# Chosina Study Area Interim Layout N01 Unit 679-446

Mapscale 1:7920 (8 inch to Mile)





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-447      ACRES: 79      VOL: 3002      MBF      ALTERNATIVES: 2,3,4,5,6

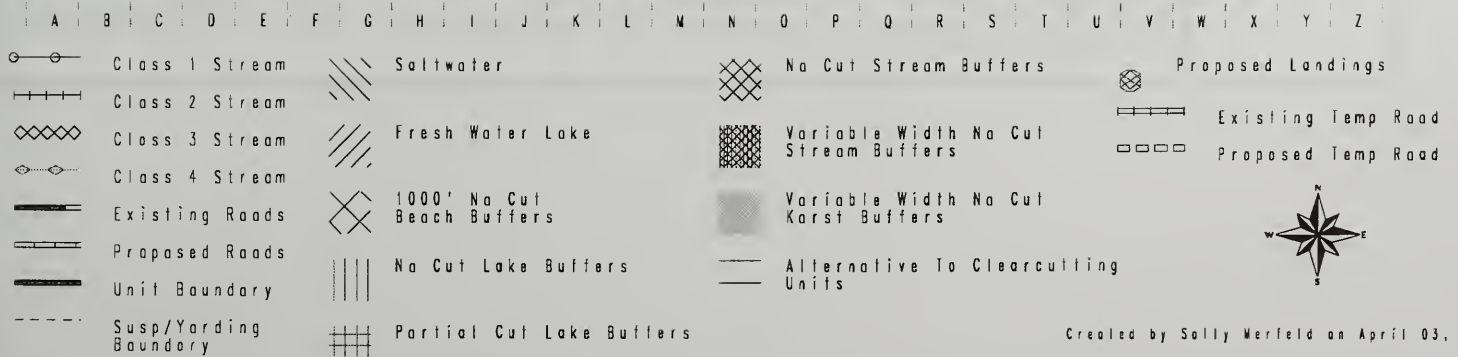
PHOTO YR/#: '91-390-145 1/4 QUAD: CRG A-1 LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-035, 67902-062, mod. windthrow risk. Retain stand structure for wildlife where feasible. Possibly karst to S.E.. Productivity of site is high. Field checking alternative regeneration methods. Maintain setting width between units to the south. Steep. Option: helicopter G.S. / cc type C.  |
| J. Oien 5/96   | ROADS: No concerns.  |
| R.Johnson<br>11/07/95  | SOILS/WATERSHED: Partial suspension for forested wetlands, MM13, rock outcrops, and possibly karst (BMPs 12.5, 13.9). May need to revisit during layout because of low volume and karst on south side of unit (BMP 13.2). Unit in watershed H61A. Additional information is filed in the reconnaissance folder.  |
| G. Pierce<br>9/97  | FISHERIES: Stream 1 is a class II blue/white at its mouth; where it enters the unit in the northwest, it was classified as a class III orange/white for 100' then changes to a class IV green/ white. Under the new TLMP (1997) standards the class III orange/ white section of stream 1 is a class IV orange/ white. This section of stream 1 was flagged orange/ white to provide additional resource protection. Stream 6 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6), inside the unit stream 6 has three tributaries, all are class IV green/ white streams.<br>Orange/white streams require directional falling, and split yarding or full suspension, and immediate removal of introduced logging debris (BMP 13.16). Green/white systems require directional falling, and split yarding (where practical) or partial suspension. Streams must be cleaned of introduced logging debris before the end of the operating season or before the yarder leaves the area (BMP 13.16, 12.6a). |
| D.Parker,<br>M.Pacheco<br>8/10/95<br>C.Tighe, T.<br>Belfield 7/13/96 | WILDLIFE:<br><br>Game trails, pellets, browse and beds. This unit is identified as an important travel corridor. Partial harvest is recommended to maintain forest structure and lessen impact on wildlife migration and dispersal. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 7/13/96 Unit surveyed for TES plants, w/ T.Belfield, botanist. <u>Malaxis monophylla</u> , bog adder's-mouth orchid ,was found in the vicinity of the unit. This plant is not on the Forest Service sensitive species list.  |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: Part of ATC study (treatment 1). Clearcut harvest type C. 0% BA retained. No other commercial entries this rotation. Monitor for PCT in 20 years.  |



# Chosina Study Area Interim Layout NOI Unit 679-447

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-450      ACRES: 64      VOL: 2161      MBF      ALTERNATIVES: 2,3,4,5,6

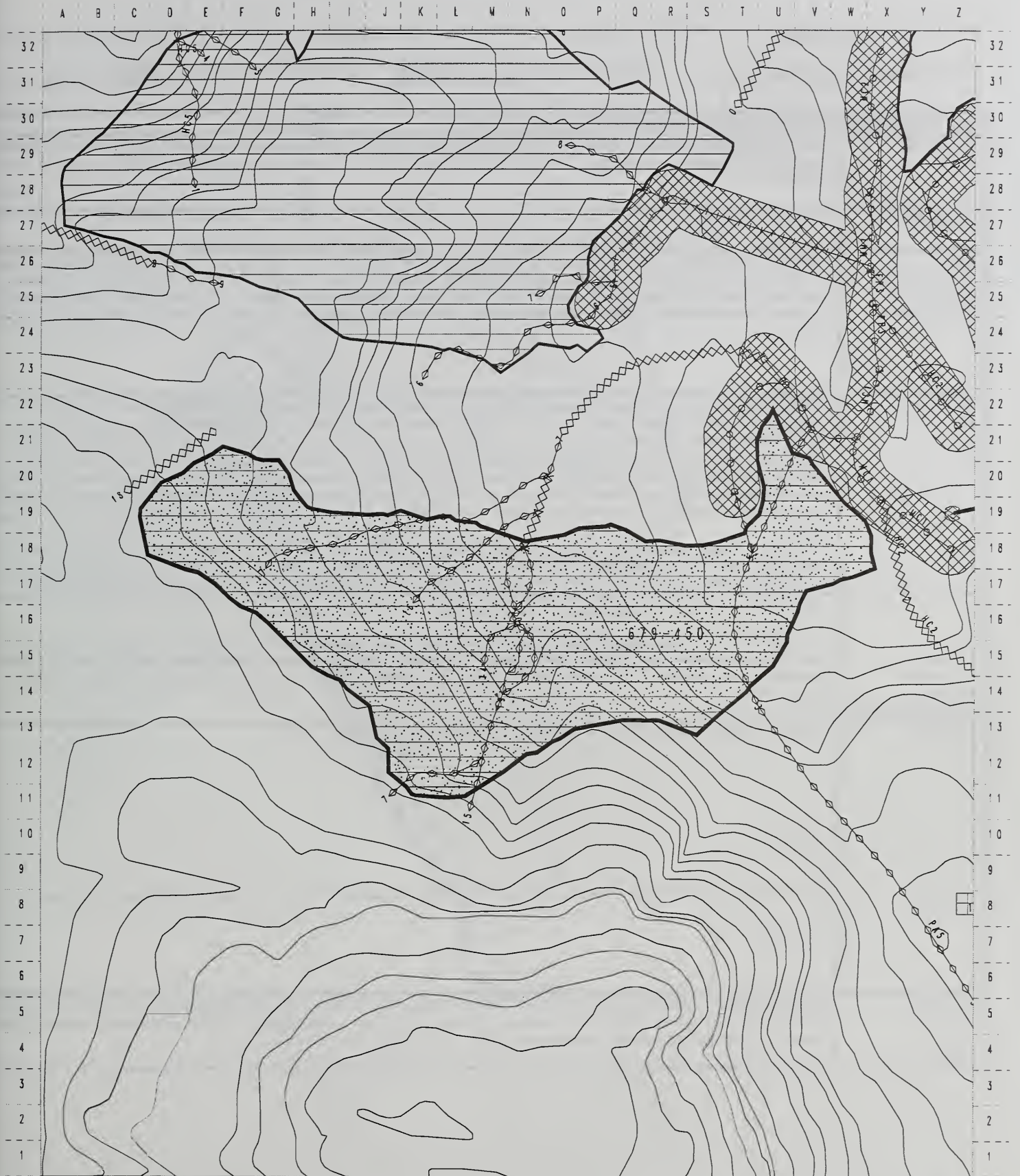
PHOTO YR/#: '91-390-144      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-53, low windthrow risk. Productivity of site is high. Unit design calls for clear-cut regeneration method. Verify roads and/or landing locations. Option: helicopter group selections if road too expensive.   |
| J. Oien 5/96   | ROADS: No concerns.   |
| R.Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped as 57E (Petrel 60-75%), 40E (Sarkar - McGilvery 60-75%), 57D (Petrel 35-60%), 442D(Ulloa-Sarkar 35-60%), 4C (Helm 5-35%), and 1D (Vixen 35-60%). Partial suspension for MMI3, forested wetland, McGilvery, and karst (BMPs 12.5, 13.9; TLMP 1997). Stream protection per fisheries (BMP 13.16). Unit in third order watershed H61A. Unit will be harvested in ATC study.  |
| G. Pierce<br>8/97  | FISHERIES: Stream 1 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 2 is a class I blue/white that requires a 120' TTRA buffer (BMP 12.6). Stream 3 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Inside the unit stream 3 is a class III orange/ white, the stream has a side channel that flows to stream 2 that is also class III orange/ white. The stream 3 class III orange/ white sections are now classified as class IV orange/ white under the new TLMP (1997) standards. Stream 3 is flagged orange/ white to provide additional resource protection. Stream 5 was a class III orange/ white, under the new TLMP (1997) standards stream 5 is a class IV orange/ white. Stream 5 is flagged orange/ white to provided additional resource protection. Stream 7 was a class III orange/ white, under the new TLMP (1997) standards stream 7 is a class IV orange/ white. Stream 7 is flagged orange/ white to provide additional resource protection. Stream 7A and 7B are class IV green/ white. Stream 10 is a class III orange/ white that is outside the unit. Stream 14 is a class IV green/ white. Stream 15 is a class IV green/ white. Stream 16 is a class IV green/ white. Stream 17 is a class IV green/ white. Stream 18 is a class III orange/ white that originates in Karst. The eastern slope break of stream 18 is the western unit boundary. Orange/white streams requires directional falling, and split yarding or full suspension, and immediate removal of introduced logging debris (BMP 13.16, 12.6a). Green/white streams requires directional felling and split yarding (where practical), or partial suspension. Must be cleaned of introduced logging debris before the end of the operating season or before the yarder leaves the area (BMP 13.16, 12.6a). |
| D.Parker,<br>M.Dillman,<br>C.Tighe<br>7/26/95<br>D.Parker,<br>B.Johnston<br>8/17/95 C.Tighe,<br>B.Johnston, A.<br>Mueller 5/22/96<br>T.Belfield 7/96 | WILDLIFE:<br><br>Deer browse, tracks and pellets throughout unit. Bear signs and wolf tracks . Dead bear found between this unit and unit 679-451. Karst canyons and faults in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 5/22/96 Large bear in helispot. This unit was surveyed for sensitive plants by the botanist. <u>Malaxis monophylla</u> , bog adder's-mouth orchid, was found in the vicinity. No plants off the Forest Service sensitive species list were found.  |
| J.Baichtal<br>5/15/96<br>10/22/96<br><br>T.Fifield<br>10/28/96   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Karst is only a minor component of the unit and of low vulnerability. There are no resource concerns for this unit. Unit layout and resource specialists found a single sinkhole in the northeast quarter of the unit, near the unit boundary. The Standards and Guidelines for Karst and Cave Resources outlined in TLMP require a minimum 100 foot buffer surrounding this feature. However, it is felt that this isolated feature can be protected by a smaller buffer, directional falling away from the feature and no yarding adjacent to or across the feature. The unit is part of the ATC, uneven-aged management study and 75% BA is retained. A better solution would be for a retention patch to be moved to encompass this feature.<br><br>LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97  | PRESCRIPTION: Large deep V-Notch SE corner-original unit. Dropped 7 acres for scrub at east and south ends. A sinkhole exists within the unit boundary in the northeastern quarter. A no harvest buffer has been flagged around this sink. Timber is to be directionally felled away from the feature. No yarding will be adjacent to or across this sinkhole. Management emphasizes protection of the feature and water quality maintenance. A retention patch should be moved to encompass this feature. Part of ATC study, uneven-aged management, 75% BA retained. Designated clumps will not be harvested. Individual trees will be marked for cut between the retention clump areas. See prescription for ATC for details (treatment 7). No further commercial treatment this rotation. Monitor for potential PCT at 15 years.  |



# Chasina Study Area Interim Layout N01 Unit 679-450

Mapscale 1:7920 (8 inches to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

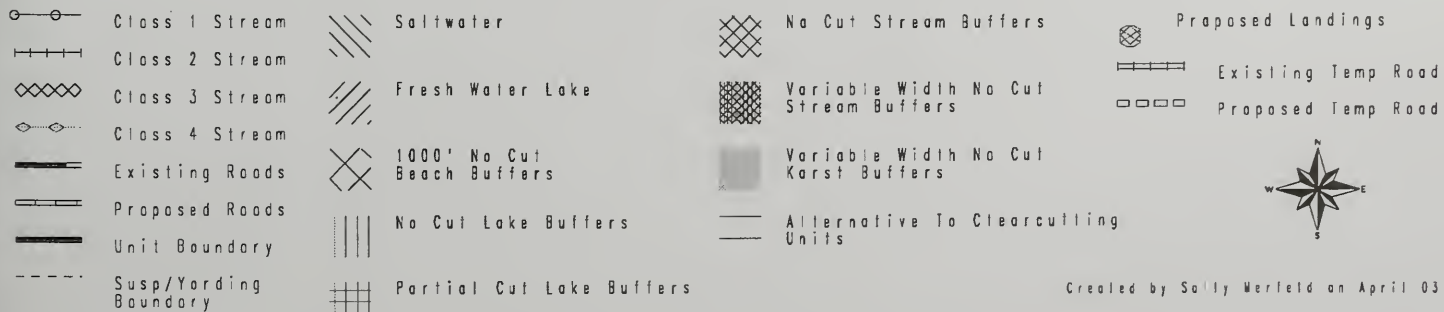
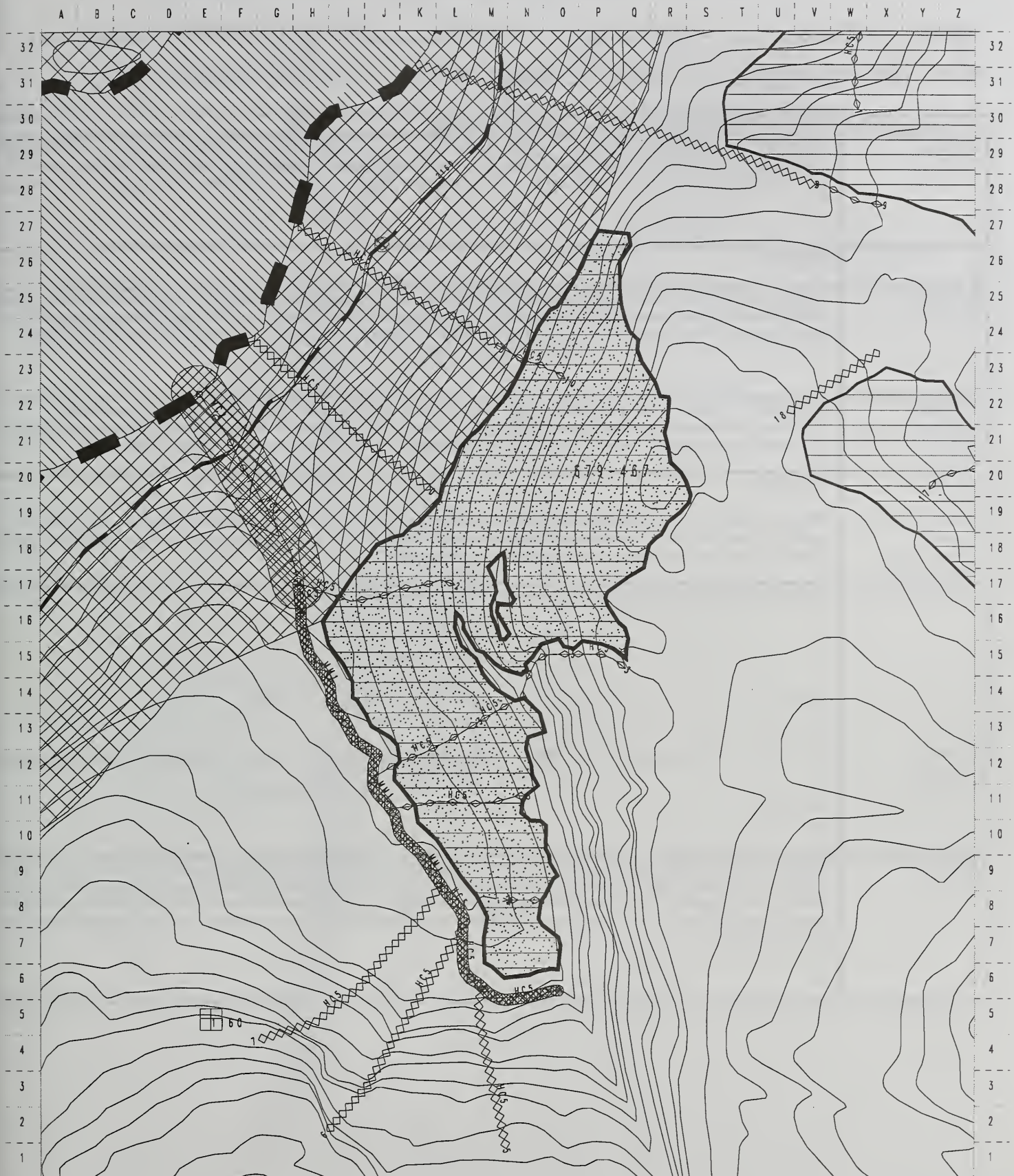
VCU-UNIT#: 679-467 ACRES: 54 VOL: 2052 MBF ALTERNATIVES: 2, 3, 4, 5, 6

PHOTO YR/#: '91-390-145      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67902-030, low windthrow risk, portion downhill yarded. Retain stand structure for wildlife where feasible. Productivity of site is high. A maze of streams at South end. Helicopter overstory removal or group selections may be an option.  |
| J. Oien 5/96   | ROADS: No concerns.  |
| Field<br>D.J.Landwehr<br>8/23/95<br>EIS R.Johnson                | SOILS/WATERSHED: A minimum of partial suspension is required (BMP 13.9). Minimum of a 100' buffer on fisheries stream #1 (BMPs 12.6, 12.6a). Green and white protection as prescribed by fisheries for streams #10, #2, and #3 (BMP 13.16). Minor amounts of Kaikli and Kitkun soils present (TLMP 1997). Additional information is filed in the reconnaissance folder. Lands previously separated into 679-506 for helicopter yarding have been added back into this unit. This unit is in third order watershed H60A.  |
| M. Driscoll<br>8/97  | FISHERIES: Stream 1 is a class III orange/ white that has a slope break buffer, and is the south west boundary of the unit. Stream 2 is a class IV green/ white. Stream 3 is a class III orange/ white near the east boundary that changes to class IV green/ white inside the unit. The class III orange/ white section of stream 3 is now a class IV orange/ white under the new TLMP (1997) standards. This section of stream 3 is flagged orange/ white to provide additional resource protection. Stream 5 was a class III orange/ white, under the new TLMP (1997) standards stream 5 is a class IV orange/ white. Stream 5 is flagged orange/ white to provide additional resource protection. Stream 6 was a class III orange/ white, under the new TLMP (1997) standards stream 6 is a class IV orange/ white. Stream 6 is flagged orange/ white to provide additional resource protection. Stream 10 is a class IV green/ white.<br>The orange/ white streams require directional falling, and split yarding, or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| D.Parker,<br>J.Wrate,<br>M.Pacheco<br>6/21/95<br>M.Dillman 10/96 | WILDLIFE:<br><br>Deer sign in unit. This unit identified as an important travel corridor. Partial harvest is recommended to maintain forest structure and lessen impact on wildlife migration and dispersal. Recommend leaving live trees and snags where possible to maintain habitat structure and snag density. This unit exceeds the steepness recommended by the current goshawk protocol so was not surveyed during 1996.  |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97<br>D.J.L., R.J.<br>10/95                       | PRESCRIPTION: Drop South 1/4 for streams. Drop west of streams - hard to read. Part of ATC study, even-aged management, clearcut with 5% BA retained for wildlife structure. Clump retained trees where possible. See ATC prescription for details (treatment 2). No further commercial treatment this rotation. Monitor for PCT at 15 years.  |

# Chosina Study Area Interim Layout NOI Unit 679-467

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

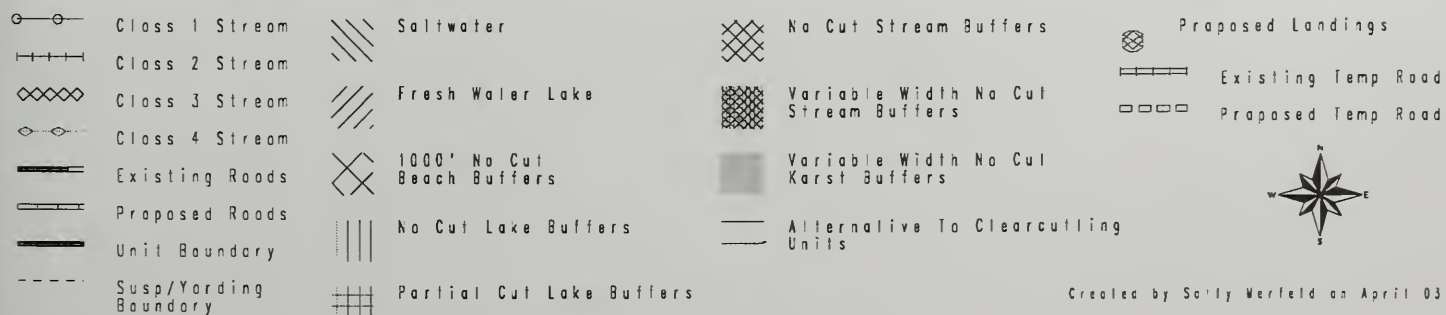
VCU-UNIT#: 679-470      ACRES: 15      VOL: 300      MBF      ALTERNATIVES: 2, 3, 6

PHOTO YR/#: '91-490-137      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: SL/RS

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67901-160, high windthrow risk, large portion downhill yarded. Unit changed to provide proportionality of volume classes. Retain stand structure for wildlife where feasible. Productivity of site is moderate. Suspension requirements (see soils or fish). Dropped off eastern 1/2 above 300' elevation due to cliffs and low volume timber in the recon process.   |
|   | ROADS:   |
| R.Johnson<br>8/03/95  | SOILS/WATERSHED: Upper boundary from 370' elevation on the south end to 200' on the north end of unit (BMP 13.5; TLMP 1997). Elevations were measured in the field and may not correspond to those shown on the unit map. Partial suspension for MMI3, forested wetlands, McGilvery, and nonstreams (BMPs 12.5, 13.9; TLMP 1997). Additional information is filed in the reconnaissance folder. Unit is in second order watershed H59A.  |
| G.Pierce<br>J.Hannon<br>8/97                                    | FISHERIES: Stream 1 is a class IV green/ white. The 3 is a class IV green/ white. Stream 4 is a class IV green/ white. The green/ white streams require directional falling, split yarding (where practical), or partial suspension. Remove introduced debris from the stream channel before the end of the operating season or before the yarder leaves the area (BMP 13.16).   |
| C.Tighe, J.Wrate<br>6/16/95<br>B.Johnston, A.<br>Mueller 6/7/96 | WILDLIFE:<br><br>This unit is identified as an important wildlife travel corridor. Partial harvest is recommended to maintain forest structure and lessen the impact on wildlife migration and dispersal. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Maintain 1000 foot estuary buffer.   |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
|   | LANDS:   |
| T.Fifield<br>10/28/96   | CULTURAL: This unit was surveyed in 1996. No cultural resources were noted. There are no concerns with the unit as planned.  |
|   | VISUALS:   |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 5% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Take unit body to stream buffer (100') to the west. Partial suspension required. 1000' buffer may impact north 1/4 of unit. Very large buffer to the west of road. Existing salvage sale below the road. The 5% retained volume can be achieved through the large and variable buffer to the west of the road. |

# Chasina Study Area Interim Layout NOI Unit 679-470

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

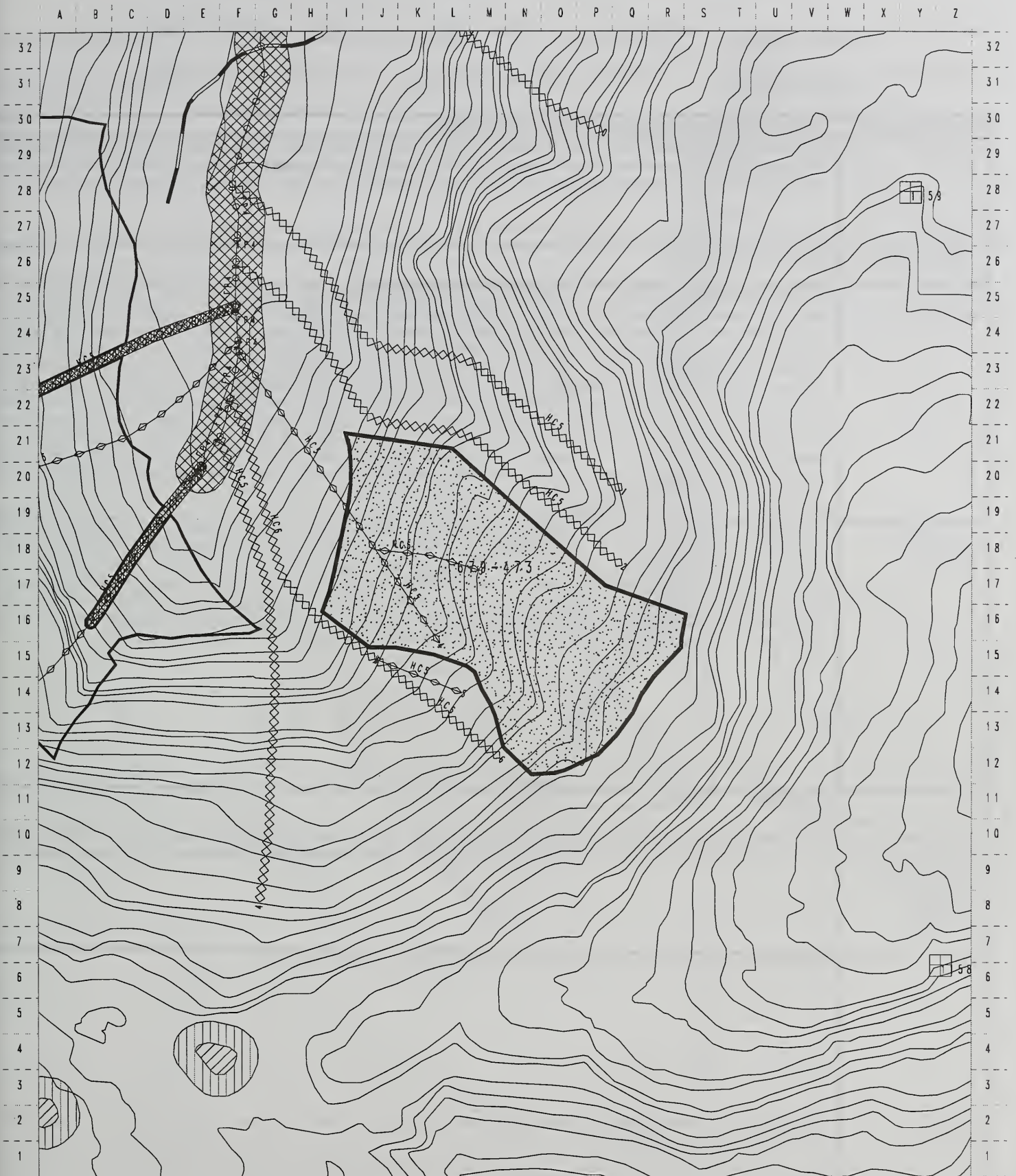
VCU-UNIT#: 679-473      ACRES: 31      VOL: 659      MBF      ALTERNATIVES: 2,4,5,6

PHOTO YR/#: '91-490-136      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS.RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 67901-162. high windthrow risk. Productivity of site is moderate. Uneconomic, low volume area above approximately 1400'. Suspension requirements (see soils or fish). Very steep.  |
| J. Oien 5/96   | ROADS: No concerns.   |
| Field<br>D.J.Landwehr<br>10/17/95<br>EIS R.Johnson               | SOILS/WATERSHED: Soils in unit are Remedios, Tolstoi, and McGilvery. Slopes 40-90%. About 2 acres of very high MM1 soils along the south boundary creek were deleted, as was MM1 4 area in the upper portion of the unit (BMP 13.5). High MM1 soils in the rest of the unit, with small cliffs. Full suspension recommended, and should be achieved with prescribed helicopter yarding (BMP 13.9). The north and south boundary streams should be designated O&W, because they are old avalanche shoots (BMP 13.16). Directional fall, split yard and clean of introduced debris. One small tributary to the south boundary creek requires no protection and is in the area deleted. One stream in the middle of the unit for G&W protection, DF, SY, or partial suspension, and clean of introduced debris before the end of the operating season. Unit is in second order watershed H59A which will have about 15-23% cumulative effects under alternatives 2,4,5 and 6 (BMP12.1; TLMP 1997). |
| K. McCartney,<br>M. Solomon<br>6/13/96                           | FISHERIES: Stream 1 is a class III orange/ white. Stream 2 is a class III orange/ white. Stream 3 is a class IV green/ white. Stream 4 is a class IV green/ white. Stream 5 is a class IV green/ white. Stream 6 is a class III orange/ white. The class III orange/ white streams require directional falling, and split yarding or full suspension. Clean introduced debris immediately from the stream channel (BMP 13.16). The class IV green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16).   |
| D.Parker,<br>M.Pacheco, B.<br>Johnston 8/1/95<br>M.Dillman 10/96 | WILDLIFE:<br><br>Deer pellets and game trails and browsed blueberries in unit. Bear sign also present. Narrow bands (<3 feet) of white marble in stream in southwest corner of unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Wildlife did not survey in 1996 due to the steepness and elevation of the unit. Both are over the standards in the current goshawk protocol.   |
| J.Baichtal   | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The lower portions of this very steep unit were surveyed in 1996. No cultural resources were noted. There are no concerns with the unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>12.97  | PRESCRIPTION: <u>Clear-cut w reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Avoid cliffs brushfields and stream buffers. Expand unit to pick up anything reachable at high elevations.   |

# Chosina Study Area Interim Layout NOI Unit 679-473

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

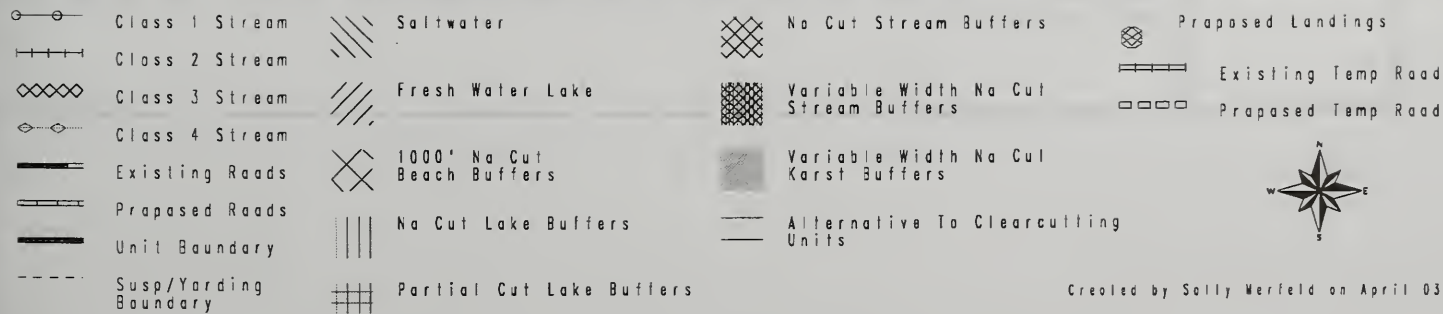
VCU-UNIT#: 679-475 w/507 ACRES: 68 VOL: 1248 MBF ALTERNATIVES: 2,4,5,6

PHOTO YR/#: '91-490-136 1/4 QUAD: CRG A-1 NE 1/4 LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67901-160, moderate windthrow risk. portion downhill yarded. Productivity of site is moderate to high / moderate. Suspension requirements (see soils or fish). Helicopter yarding method above cable reach of lower unit. adjust bdry accordingly. Due to resource protection (507). Small cable portion if soils can be protected. Main option: helicopter.   |
| J. Oien 5/96  | ROADS: No concerns.   |
| R.Johnson<br>10/19/95   | SOILS/WATERSHED: Includes unit 679-507 now that the unit has been changed to helicopter yarding. Below 500' soils are primarily Tolstoi and colluvial McGilvery, with Remedios and lithic Shakan. Slopes are generally less than 75%, although there are inclusions of rock outcrops and slopes as much as 110%, particularly on the N end of the unit. Partial suspension for MMI3 McGilvery and inclusions (BMP 13.9; TLMP 1997). The zone from 500-1000' is still Tolstoi and colluvial McGilvery with lithic Shakan, but slopes average 75-100% with rock outcrops and rock faces, rock slides and slide sluice outs, seeps, blowdown, MMI4 soils, and young second growth. Marginal area to be logged and should be deleted. Partial cut will harvest the unit while excluding the rock faces and outcrops is an option with helicopter yarding. If these areas are not deleted then BMPs 13.5, 13.9; TLMP 1997 apply. Windthrow is likely in the 500-1000' zone if it is partial cut. The upper backline is at 900' -1000' because of nearly continuous rock faces. McGilvery and lithic Shakan, (MMI4), soils above this elevation (BMP 13.5; TLMP 1997). Elevations were measured in the field and may not correspond with those shown on the unit map. Orange and white stream protection for the creek near the south boundary and green and white for the three creeks in the unit and the creek on the north boundary (BMP 13.16). Unit is second order watershed H59A, which will have about 15-23% cumulative effect under alternatives 2, 4, 5, and 6 (BMP 12.1; TLMP 1997). |
| K. Buckley,<br>M. Solomon,<br>6/21/96   | FISHERIES: Stream 1 is a class III orange/ white that requires a slope break plus 25' buffer ( BMP 13.16). Stream 2 is a class IV green/ white. Stream 3 is a class IV green/ white. Stream 4 is a class III orange/ white. The orange/ white stream requires directional falling, and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Remove introduced debris before the end of the operating season or before the yarder leaves the area (BMP 13.16). <u>O&amp;W streams</u> require DF, full over or SY and cleaning of introduced debris immediately. <u>G&amp;W streams</u> requires DF, and SY (where practical) or partial over, and cleaning the stream of introduced debris before the end of the operating period or before the yarder leaves the area.  |
| M.Dillman, J.<br>Wrate 7/11/95<br>C.Tighe,<br>B.Johnston,<br>A.Mueller<br>6/27/96 | WILDLIFE:<br><br>Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Wildlife surveyed this unit with 679-507 which is the helicopter portion of 679-475. Rocky unstable ground/landslides and blowdown in the unit.  |
| T.Fifield<br>10/28/96   | GEOLOGY MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br>LANDS:<br><br>CULTURAL: The lower portions of this very steep unit were surveyed in 1996. No cultural resources were noted. There are no concerns with the unit as planned.<br><br>VISUALS:  |
| G.Lawton<br>12.97   | PRESCRIPTION: Overstory removal of everything above 16" DBH. Logging by helicopter prevents additional road building and bridge replacement. Leave snags standing and intact where possible.  |

# Chosino Study Area Interim Layout N01 Unit 679-475

Mapscale 1:7920 (8 inch to Mile)





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-477 ACRES: 35 NO CUT VOL: 1330 MBF ALTERNATIVES: 2, 3, 4, 5, 6

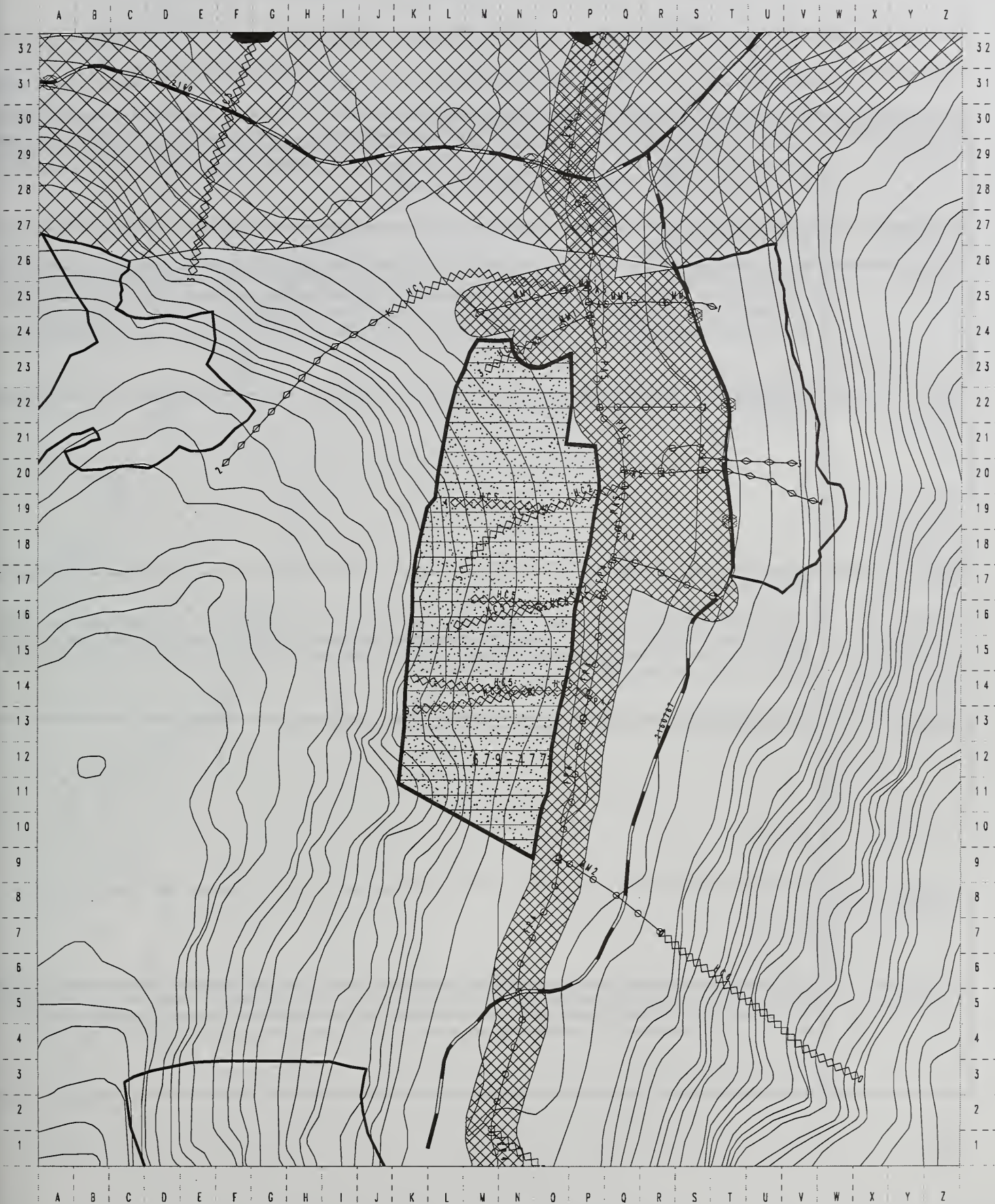
PHOTO YR/#: '91-490-137 1/4 QUAD: CRG A-1 NE 1/4 LOGGING SYSTEMS: HE

[illegible]



# Chosina Study Area Interim Layout NOI Unit 679-477

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-479      ACRES: 18      VOL: 684      MBF      ALTERNATIVES: 3,4,5,6

PHOTO YR/#: '91-490-137      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67901-151 and 152, high windthrow risk, high mistletoe present. Retain stand structure for wild-life where feasible. Productivity of site is high. Dropped out major cliff on NE area and estuary buffer. Leave 3 cedar seed trees / acre, clear-cut w/ reserves. Maintain setting width between units.  |
| J. Oien 5/96  | ROADS: No concerns.   |
| R.Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped as 3D (Vixen - Traitors 35-60%) , 4D (Helm 35-60%), and 6 (McGilvery- Traitors 60-100%). Helicopter yarding is prescribed and meets requirements for partial suspension on forested wetlands, MMI3 and McGilvery (BMPs 12.5, 13.9; TLMP 1997). Steep and rock face N boundary deleted by silviculture. Protection of class III or IV streams per fisheries (BMP 13.16). Karst reported by fisheries and wildlife, and may need field review during layout (BMP 13.2). |
| G.Pierce<br>8/97  | FISHERIES: No streams were found in this unit.  |
| D.Parker,<br>B.Johnston, M.<br>Pacheco 8/3/95<br>B.Johnston, A.<br>Mueller 6/7/96 | WILDLIFE:<br><br>Game trails and bear scat throughout. Loon was heard from northwest area of unit (Kitkun Bay). Karst fault seen in unit. Unit is in an important wildlife travel corridor. Recommend partial harvest to maintain forest structure and lessen the impact on wildlife migration and dispersal. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/7/96 Deer sign in unit.   |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut - leave 5% structure. Leave 3 cedar seed trees/ac for seeding/structure purpose. Keep unit small in size to minimize impact to deer corridor.  |

# Chosino Study Area Interim Layout N01 Unit 679-479

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 679-497      ACRES: 21      VOL: 694      MBF      ALTERNATIVES: 3, 4, 5, 6

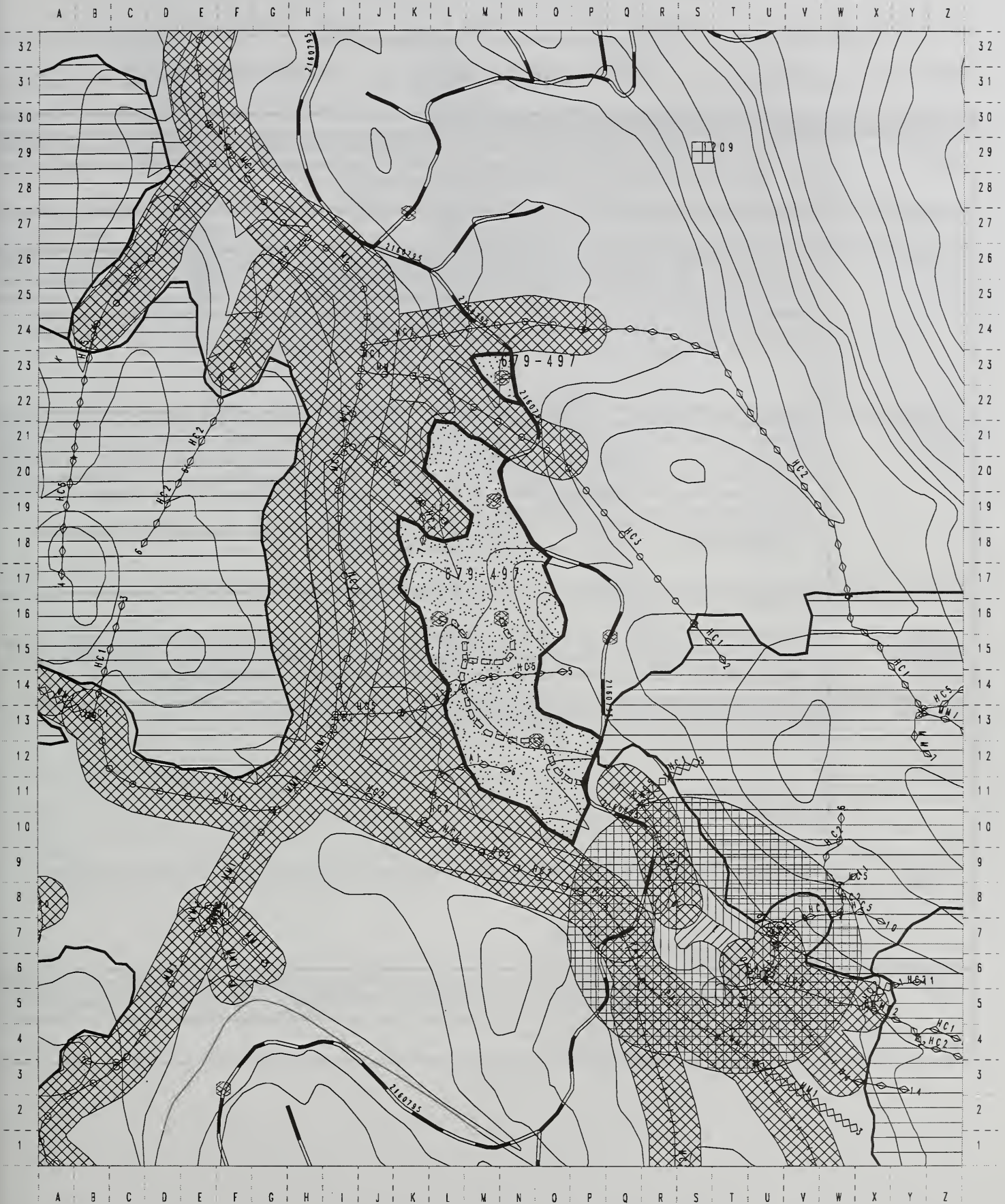
PHOTO YR/#: '91-390-145      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: RS/SH

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 67902-82 and -035, moderate windthrow risk. Productivity of site is high. Maintain setting width between units. Spur roads will need extending, shovel flat ground. Partial cut buffer.   |
| J. Oien 5/96  | ROADS: Existing culverts are not be passable to fish and may need work (BMP 14.14).  |
| R.Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 1C (Vixen 5-35%) and 550C (StNicholas - Kaikli 5-35%). Partial suspension for forested wetlands (BMPs 12.5, 13.9). Shovel log per protection guidelines in BMP 13.9 for slope, topography, support shovel, crossing streams, felling, spur roads, and turns. Minor amounts of Kaikli soil present (TLMP 1997). Unit lies in third order watershed H62A, which will have about 42% cumulative effect under alternative 3(BMP 12.1; TLMP 1997). Unit is the same size, changed slightly by presale following EIS review.   |
| M.Driscoll<br>8/97  | FISHERIES: Stream 1 is a class I blue/ white that requires a 150' TTRA buffer (BMP 12.6). Stream 2 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 3 is a Class I Blue/ white that requires a 120' buffer (BMP 12.6). Stream 4 is a class I blue/ white that requires 120' TTRA buffers on all channels (BMP 12.6). Stream 5 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 5 turns into a class III orange/ white 200' into the unit, and class IV green/white in its upper sections. The class III orange/ white section of stream 5 is now classified as a class IV orange/ white under the new TLMP (1997) standards. This section of stream 5 is flagged orange/ white to provide additional resource protection. The orange/ white stream requires directional falling, and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16). |
| D.Parker,<br>J.Wrate, M.<br>Pacheco 6/21/95<br>M.Dillman<br>7/11/96 | WILDLIFE:<br>Deer and bear sign seen in unit. Fawn hoof found--wolf kill. 7/11/96 Deer and bear sign-pellets, trails, scat, tracks, and dug-up skunk cabbage seen in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density  |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave concerns.   |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 5% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. <u>Partial suspension required</u> and full suspension w/ shovel yarding. Dropped 3 acres in SW corner buffer between creeks. Shovel yard where possible set boundry lines with windthrow potential in mind. Topography will dictate width of stream buffers. Feather boundary around small northern section to reduce risk of windthrow.  |



# Chosino Study Area Interim Layout NOI Unit 679-497

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

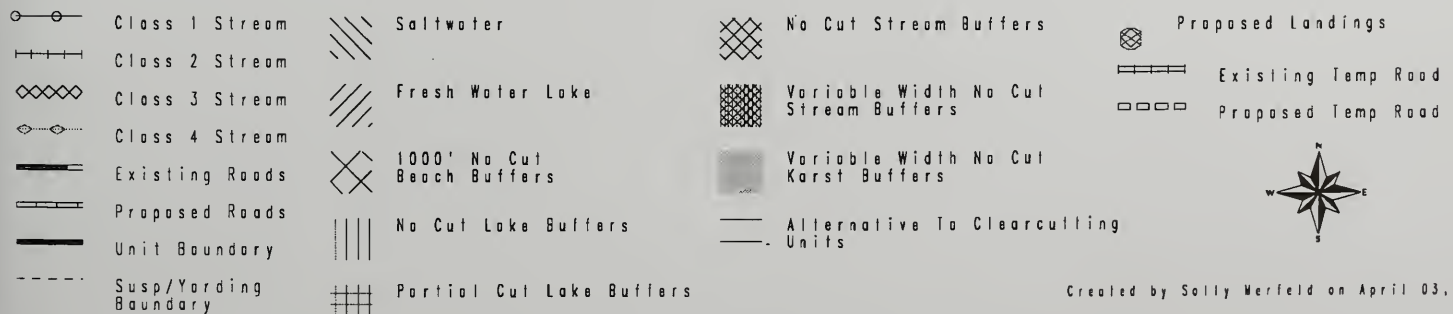
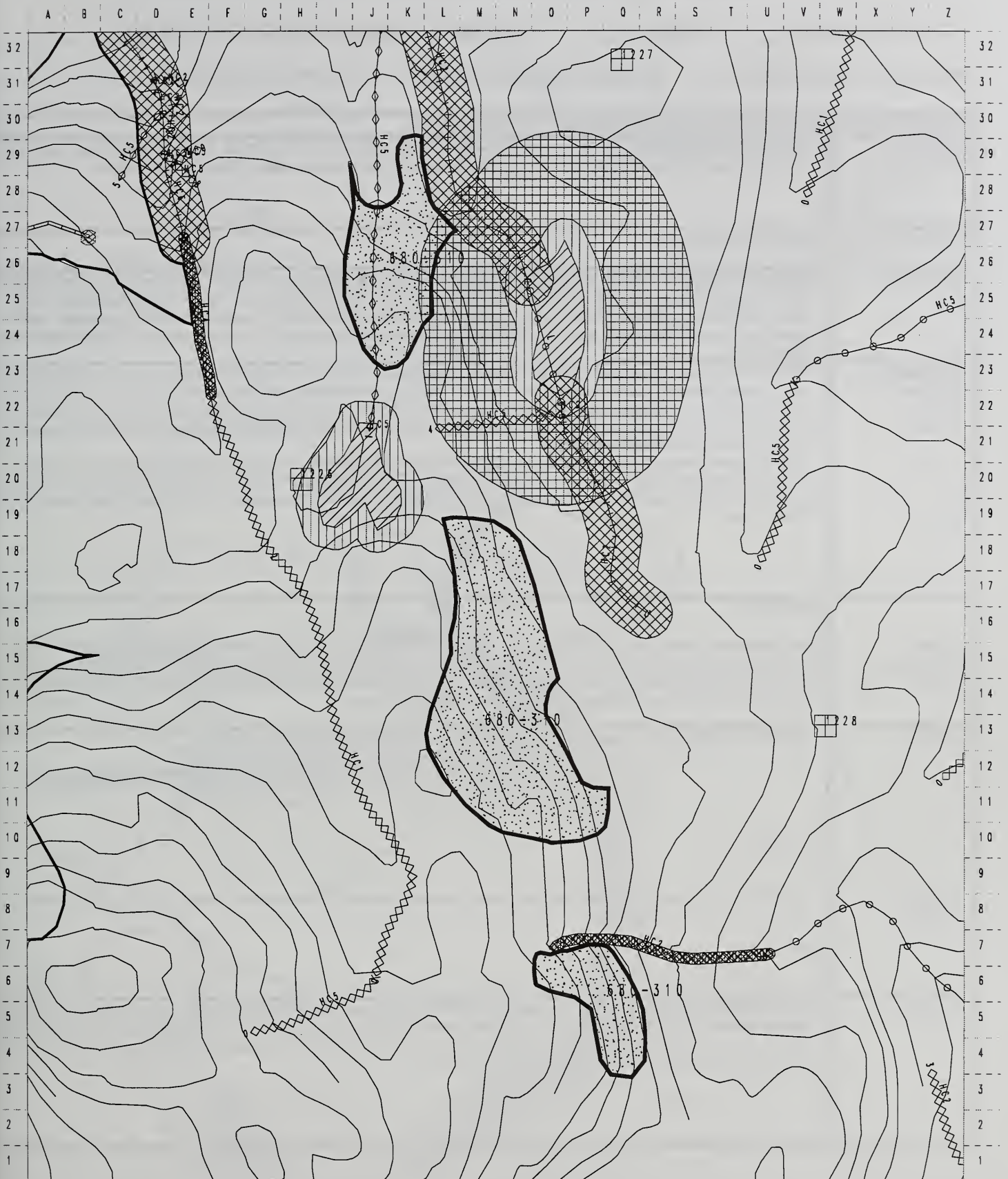
VCU-UNIT#: 680-310      ACRES: 27      VOL: 342      MBF      ALTERNATIVES: 3, 5, 6

PHOTO YR/#: '91-390-225      1/4 QUAD: KTN B-6 SE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                        | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--------------------------------------|--|
| G.Lawton<br>12/97                    | SILVICULTURE/TIMBER: 68002-078, low windthrow risk, portion downhill yarded. Productivity of site is low. Uneconomic, low volume area between and surrounding portions of unit. If road continues south will need to spur to southern section of unit. Anticipate planting 14 acres of Alaska yellow cedar to maintain composition.  |
| J. Oien 5/96                         | ROADS: No concerns.  |
| R.Johnson<br>6/96                    | SOILS/WATERSHED: Soils mapped 550C (StNicholas - Kaikli 5-35%), 550D (St. Nicholas-Kaikli 35-60%), and 86 CD (Kaikli - Grindall 5-60%). Partial suspension for forested wetlands and MMI3(BMPs 12.5, 13.9). Fisheries reported and deleted area on S end because of cliffs and McGilvery (TLMP 1997). Partial suspension for any remaining McGilvery (TLMP 1997). Silviculture deleted and added to avoid low volume (BMP 12.5). Concern whether there are adequate tail holds and anchors for suspension. Prescriptions by fisheries for buffers on streams and lakes (BMPs 12.6, 12.6a, 13.16). Minor amount of Kaikli soils present (TLMP 1997). May need to review during layout because of McGilvery and rock (BMP 13.2; TLMP 1997).  |
| K. Buckley,<br>M. Becker,<br>8/29/95 | FISHERIES: There are two Lakes near the unit. The lake to the east requires a 100' no cut/ 400' partial cut buffer, the lake to the west requires a 100' water quality buffer (BMP 12.6). Stream 1 was a class III orange/ white, under the new TLMP (1997) standards stream 1 is a class IV orange/ white that is 1 foot wide, has 2 feet of incision, and 37% gradient. Stream 2 is a class II blue/ white that will require a 120' TTRA buffer (BMP 12.6). Stream 3 is a class II blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 4 is a class III orange/ white, this stream is outside the unit boundary. Stream 5 is a class III orange/ white. The southern slope break of this stream is the unit boundary.<br>The orange/ white streams require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16). McGilvery soils and pistol butted trees noted in unit. |
| A.Mueller,<br>B.Johnston<br>7/19/96  | WILDLIFE:<br><br>Deer pellets and beds, game trails, and bear scat seen throughout area. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This unit did not rate as a high priority area for goshawks and so was not surveyed during 1995. The habitat did not meet the habitat requirements in the current goshawk protocols.  |
| J.Baichtal                           | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                    | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 5% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type B clear-cut, leave <u>cedar</u> seed trees. Helicopter all. Partial suspension required for soils protection. Most uneconomical portions dropped already. Potential planting of YC or spruce. Monitor for PCt at 25+ years.   |

# Chosina Study Area Interim Layout NOI Unit 680-310

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

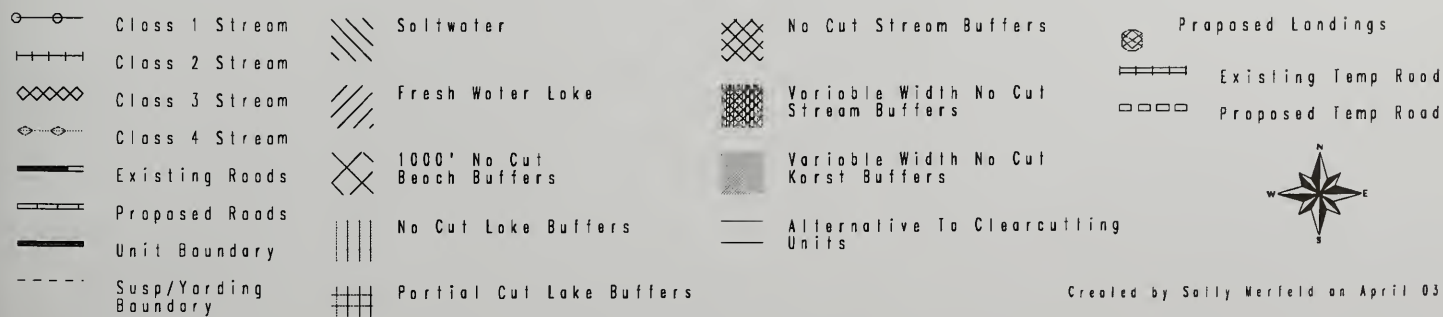
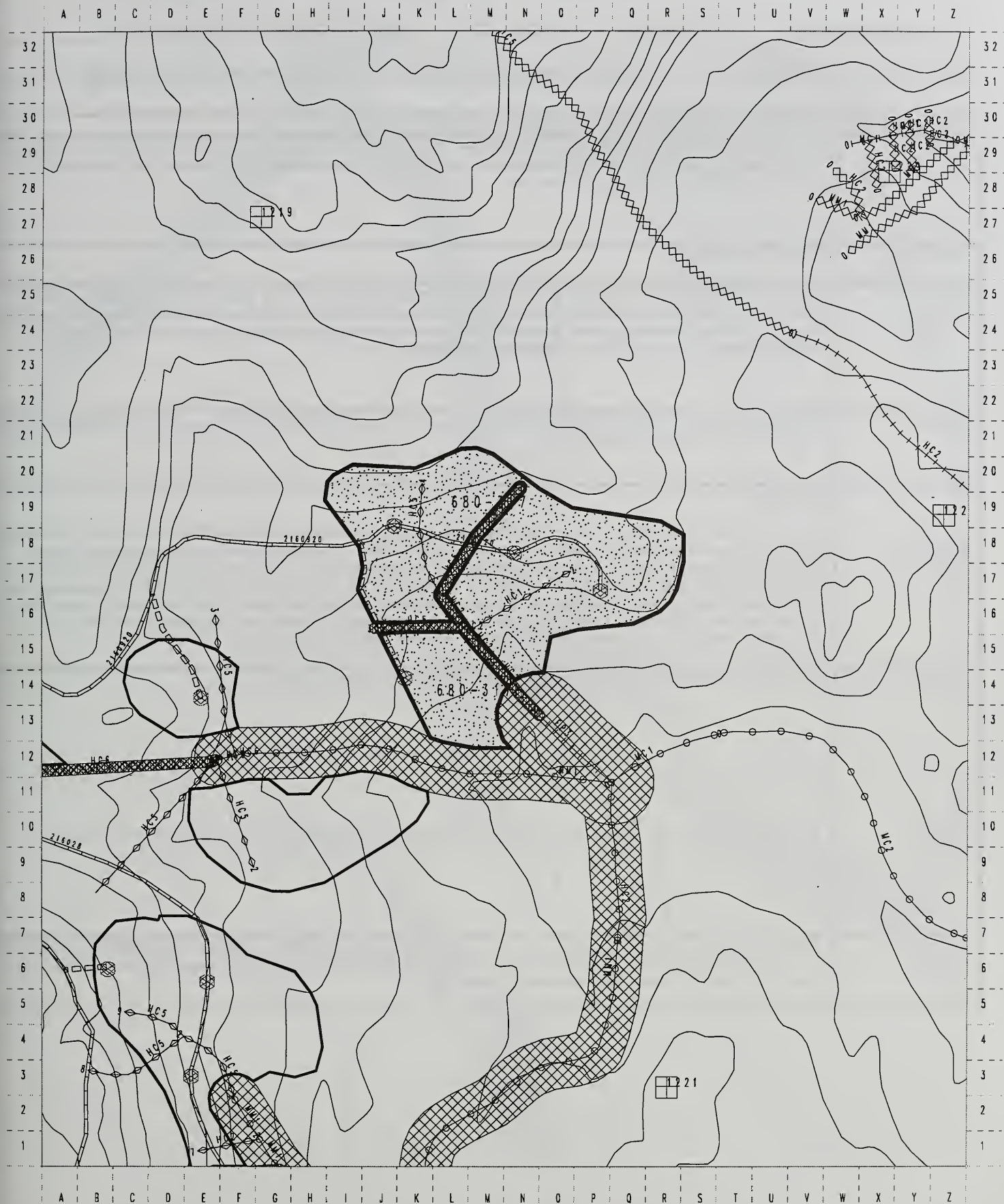
VCU-UNIT#: 680-317    ACRES: 28    VOL: 500    MBF    ALTERNATIVES: 3, 5, 6

PHOTO YR/#: '91-390-224    1/4 QUAD: CRG A-1 NE 1/4    LOGGING SYSTEMS: RS

| REVIEWER&DATE                                   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                               | SILVICULTURE/TIMBER: 68002- low windthrow risk. Productivity of site is moderate. Dropped uneconomic, low volume area surrounding, to the south and east of creek. Maintain setting width between units. Shovel yard 1/3 of unit.   |
| J. Oien 5/96                                    | ROADS: No concerns.   |
| R.Johnson<br>6/96                               | SOILS/WATERSHED: Soils mapped as 31C (Wadleigh 5-35%), 550C (StNicholas - Kaikli 5-35%) , and 86CD(Kaikli-Grindell 5-60%). Partial suspension for forested wetlands (BMPs 12.5, 13.9). Silviculture deleted S end for low volume (BMP 12.5). Stream protection per fisheries(BMP 13.16). Third order watershed E92A. Maintain standards for slope, topography, walk on waste wood, crossing drainages, spur roads, and turns for shovel yarding per BMP 13.9 . Minor amounts of Kaikli soils present (TLMP 1997).   |
| K.McCartney,<br>K.Kitchel,<br>S.Deck<br>6/18/96 | FISHERIES: Stream 1 is a class II blue/white TTRA that requires a 200' buffer (BMP 12.6). The upper reach of this stream becomes a class III orange/white stream that is 9 feet wide, has 29 feet of incision, and 9% gradient. This section of stream 1 will require a slope break buffer. Stream 2 is a class IV green/white stream. Stream 3 is a class III orange/white that flows directly into stream 1 that is 3 feet wide, has 21 feet of incision and 16% gradient. Stream 3 will require a slope break buffer. Stream 4 is a class IV green/white tributary to stream 1.<br>The orange/white streams require directional falling, split yarding or full suspension, and the immediate removal of introduced debris (BMP 13.16) if buffers are not needed. The green/white streams require directional falling, split yarding (where practical) or partial suspension, and the removal of introduced debris before the yarder leaves the area or by the end of the operating season (BMP 13.16). |
| C.Tighe,<br>B.Johnston, A.<br>Mueller 6/14/96   | WILDLIFE:<br><br>Deer sign (beds, pellets) seen. Game trails and bear scat seen in unit as well. One dead deer found in close proximity to unit. Fisheries crew reported seeing a mouse-like mammal along creek. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This unit was not surveyed during 1995 due to the fact that the habitat did not meet the volume class requirements in the current goshawk protocols.   |
| J.Baichtal                                      | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96                           | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                               | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type B clear-cut. Partial suspension required, and shovel yarding. May have to drop spur and narrow portion to the southwest. Uneconomical if unit complex to the south and west are dropped. Monitor for PCT at 25 years.  |

# Chosina Study Area Interim Layout NO1 Unit 680-317

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 680-330      ACRES: 28      VOL: 378      MBF      ALTERNATIVES: 2, 3, 5, 6

PHOTO YR/#: '72(53)-1872-33      1/4 QUAD: KTN A-6 NW 1/4      LOGGING SYSTEMS: RS/HE

| REVIEWER&DATE                     | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|-----------------------------------|---|
| G.Lawton<br>12/97                 | SILVICULTURE/TIMBER: 68002-016, low windthrow risk, mod. mistletoe present. Productivity of site is low. Adjacent to private harvesting. Maintain setting width between units surrounding. Anticipate planting 20 acres of Alaska yellow cedar to maintain composition. Very scrubby at north end.  |
| J. Oien 5/96                      | ROADS: No concerns.   |
| R.Johnson<br>6/96                 | SOILS/WATERSHED: Partial suspension for the forested wetlands (BMPs 12.5, 13.9). Minor amounts of Kaikli and Kitkun soils present (TLMP 1997). North end of this area is where stream #3 changes into a blue and white class I from a blue and white class II. This is near the survey marker. Stream #3 is the main north-south stream in the unit. Streams had been identified and tagged by fisheries. Unit partially lies in third order watershed E94A.  |
| J.Bauers<br>8/97                  | FISHERIES: Stream 1 is a class I blue/ white that requires a 100' TTRA buffer (BMP 12.6). Stream 2 is a class I blue/ white that requires a 100' TTRA buffer (BMP 12.6).  |
| C.Tighe,<br>B.Johnston<br>7/10/96 | WILDLIFE:<br><br>This unit is within one-half mile of a known bald eagle nest. Road construction must be accomplished in accordance with the Bald Eagle Protection Act and must also comply with the MOU between the U.S. Fish and Wildlife Service and the Forest Service. Written coordination with the U.S. Fish and Wildlife Service must be documented. To provide for adequate snag density and distribution within the VCU, recommend leaving a 0.1 acre or larger snag patch for each 10 acres of unit. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. There is an area of approximately 30 harvested trees, in NE corner of unit. This unit was not surveyed during 1995 due to the fact that the habitat did not meet the requirements called for in the current goshawk protocols. Maintain 1000 foot estuary buffer. |
| J.Baichtal                        | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96             | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                 | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10 - 20% of cutting unit(TTRA buffer provides the reserves) where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Major complications with stream buffers.  |

# Chosina Study Area Interim Layout N01 Unit 680-330

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

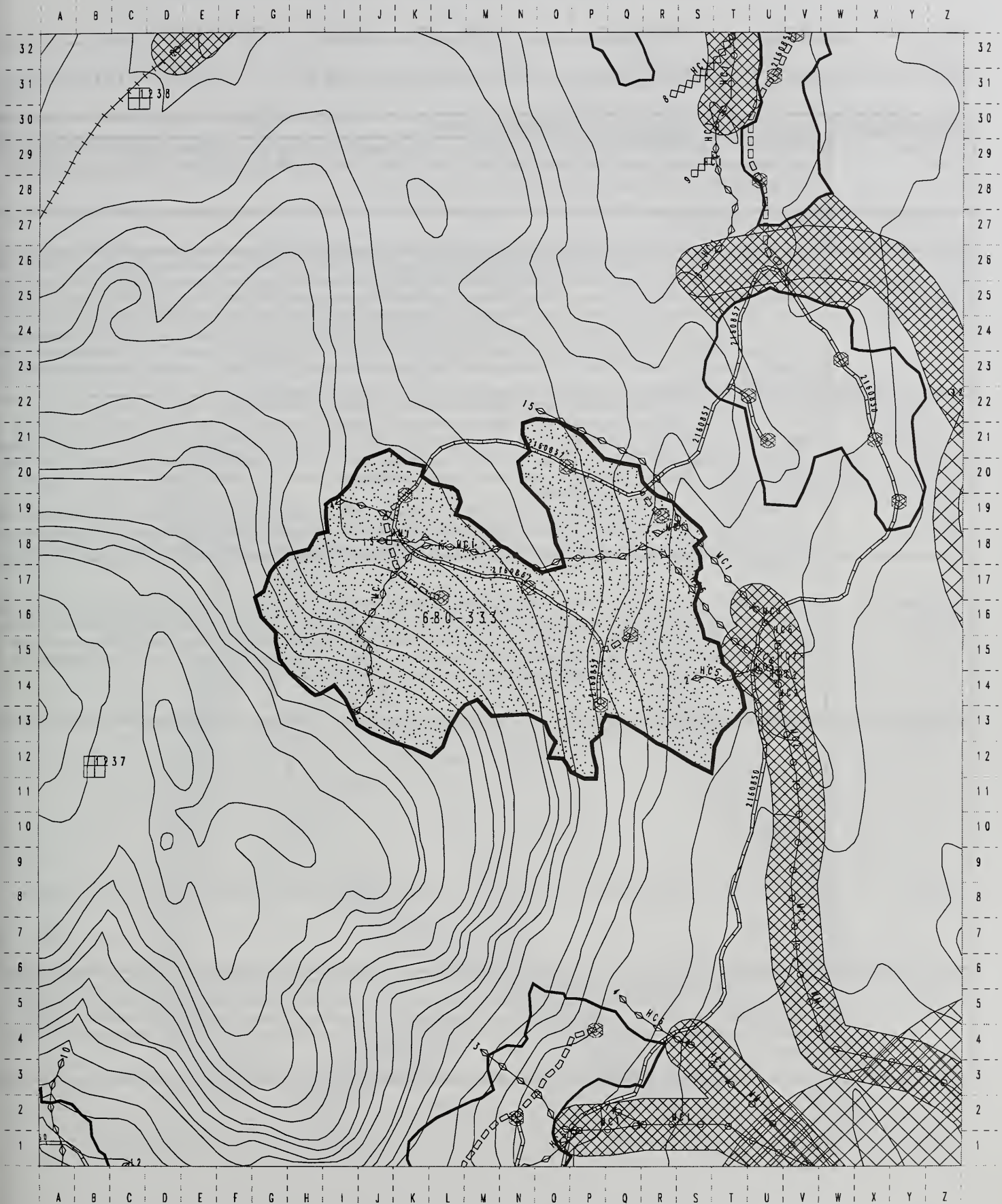
VCU-UNIT#: 680-333      ACRES: 52      VOL: 1170      MBF      ALTERNATIVES: 2, 3, 6

PHOTO YR/#: '72(53)-32-1872/'91-390-218, 219      1/4 QUAD: KTN A-6 NW 1/4      LOGGING SYSTEMS: SH/SL/RS

| REVIEWER&DATE                                       | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97                                   | SILVICULTURE/TIMBER: 68001-10. High windthrow risk, portion downhill yarded. Partial cut buffer. Productivity of site is moderate. Adjacent to native cuts. Uneconomic, low volume area northeast & southwest. Maintain setting width between units. Difficult terrain - potential blind leads in upper slope. Verify feasibility and modify unit bdry as required. Profiles needed.   |
| J. Oien 5/96  | ROADS: Evaluate road location to determine which side of creek is best for logging.  |
| field<br>D.J.Landwehr<br>8/9&15/95<br>EIS R.Johnson | SOILS/WATERSHED: Partial suspension for MMI3 and forested wetland soils (BMPs 12.5, 13.9). Small area of MMI4 soils deleted at head of several small streams in the southwest portion of the unit near the backline. A minimum of good partial suspension is required; area should be deleted if good suspension is not possible (BMPs 13.5, 13.9). Shovel yarding may be feasible on areas between creeks in north part of unit (BMP 13.9). Unit should be designed to prevent blowdown. Prescriptions for streams changed to agree with those of fisheries (BMP 13.6). Additional information is filed in the reconnaissance folder. Minor amounts of Kitkun soils present (TLMP 1997).  |
| M.Driscoll<br>8/97                                  | FISHERIES: Stream 1 is a class IV green/ white, that changes to a class IV orange/ white. This section of stream 1 is flagged orange/ white to provide additional resource protection. Stream 2 is a class IV green/ white. Stream 3 is a class IV green/ white. Stream 13 is a class IV green/ white. Stream 14 is a class IV green/ white. Stream 15 is a class IV green/ white. The orange/ white stream require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16). |
| C.Tighe,<br>B.Johnston<br>7/12/96                   | WILDLIFE:<br><br>Unit contains some excellent goshawk habitat. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This unit was not surveyed during 1995. Apparently within the unit is an isolated patch of good habitat but overall the area did not meet the habitat requirements called for in the current goshawk protocols.   |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96                               | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                                   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Dropped 25 acres due to scrub and steep slopes. Optional: Helicopter overstory removal, greater than 25"DBH- all species.  |

# Chasina Study Area Interim Layout N01 Unit 680-333

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-304      ACRES: 52      VOL: 639      MBF      ALTERNATIVES: 2,3,5,6

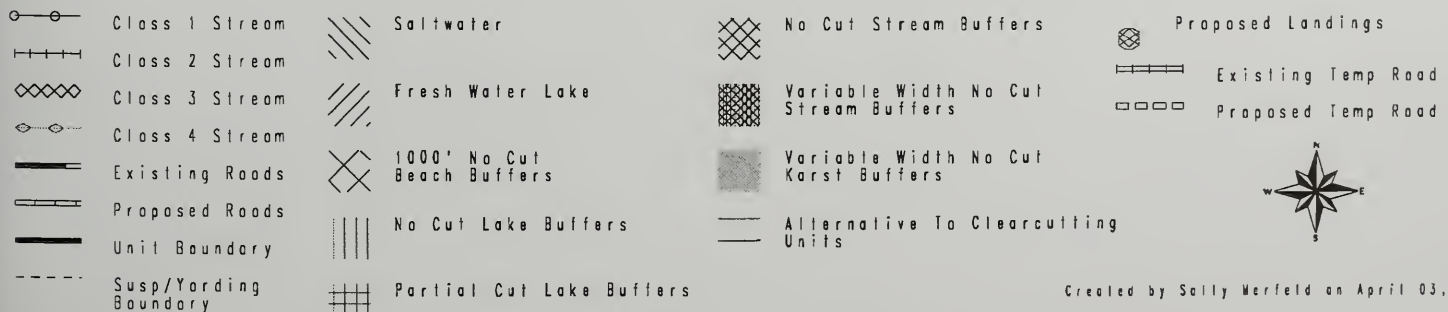
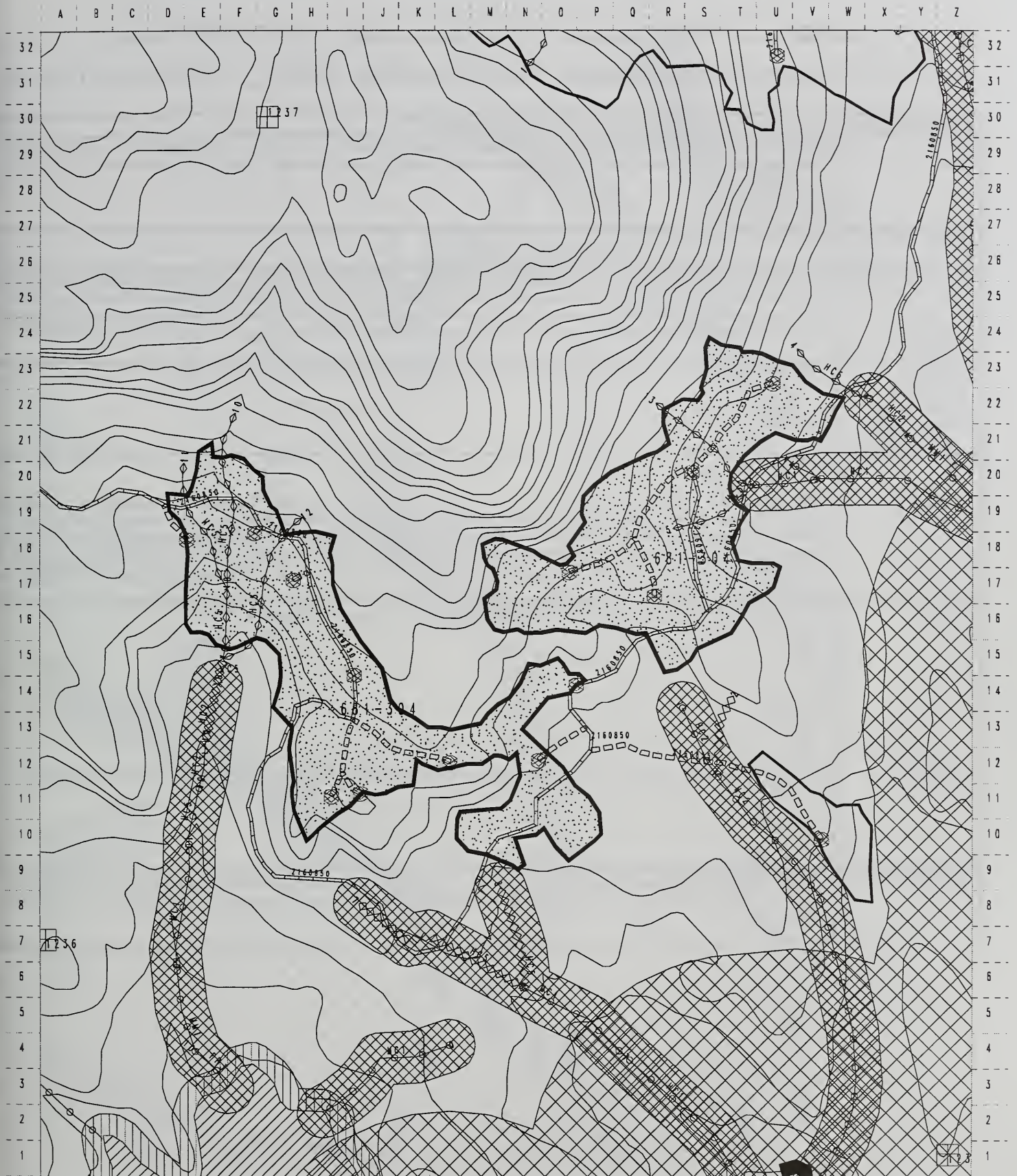
PHOTO YR/#: '72(53)-1872-31/'91(L46)-390-218      1/4 QUAD: KTN A-6 NW 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE                                      | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97                                  | SILVICULTURE/TIMBER: 68101-030, high windthrow risk. Productivity of site is low. Partial cut buffer. Adjacent to private selections. Difficult terrain - potential blind leads in several areas. Verify feasibility and modify unit bdry as required. Profiles needed. Road connections need work. High mistletoe infection.   |
| J. Oien 5/96                                       | ROADS: No concerns.   |
| field<br>D.J.Landwehr<br>8/11/95<br>EIS R. Johnson | SOILS/WATERSHED: A minimum of partial suspension is required for MM13, McGilvery, and forested wetlands (BMPS 12.5, 13.9; TLMP 1997). Full suspension is needed along the north boundary to protect young regeneration (BMP 13.19). Locate backline in northeast and center portions of unit at the base of the first cliffs south of the old landslide to avoid MMI4 and cliffs (BMP 13.5). Selective harvest in the addition west of the big cliff to protect regeneration that has grown following blowdown (BMPs 12.17, 13, 13.1). Unit should be designed to prevent blowdown. Protection of streams per fisheries, plus green and white protection for two additional streams (BMP 13.16). One stream is in the vicinity of fisheries #12 in the southwest corner of the unit, and the other is between fisheries #4 and #5. Minor amounts of Kitkun soil present (TLMP 1997). Additional information is filed in the reconnaissance folder.  |
| G. Pierce<br>8/97                                  | FISHERIES: Stream 4 is a class I blue/ white below the road that requires a 120' TTRA buffer, and road timing (BMP 12.6, 14.14). Above the road crossing stream 4 is a class IV green/ white. Stream 3 is a class IV green/ white. Stream 5 is a class I blue/ white below the road that requires a 100' TTRA buffer and requires fish timing (BMP 12.6, 14.14); the remainder of stream 5 is a class IV green/ white. Stream 10 was a class III orange/ white, under the new TLMP (1997) standards stream 10 is a class IV orange/ white. Stream 10 is flagged orange/ white to provide additional resource protection. Stream 11 is a class IV green/ white. Stream 12 is a class IV green/ white.<br>The orange/ white streams require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| B.Johnston,<br>A.Mueller<br>7/26/96                | WILDLIFE:<br><br>This unit is within one-half mile of a known bald eagle nest. Road construction must be accomplished in accordance with the Bald Eagle Protection Act and must comply with the MOU between the U.S. Fish and Wildlife Service and the Forest Service. Written coordination with the U.S. Fish and Wildlife Service must be documented. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This was not a high priority unit for wildlife following the current goshawk protocol, due to habitat requirements, and as a result was not surveyed in 1995.   |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96                              | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                                  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Full suspension helicopter yarding along north boundry. Backline northeast and center base of first cliffs south of all landslide. Selective harvest by helicopter for add on west of big cliff. Dropped acreage due to steep cliffs and scrub timber. Monitor for PCT at 25+ years.  |



# Chasina Study Area Interim Layout N01 Unit 681-304

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-308      ACRES: 3      VOL: 30      MBF      ALTERNATIVES: 2,3,5,6

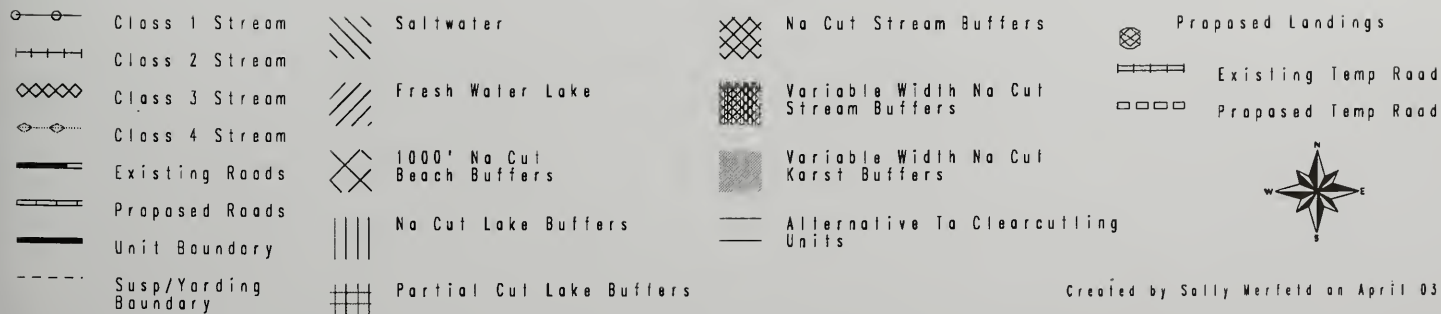
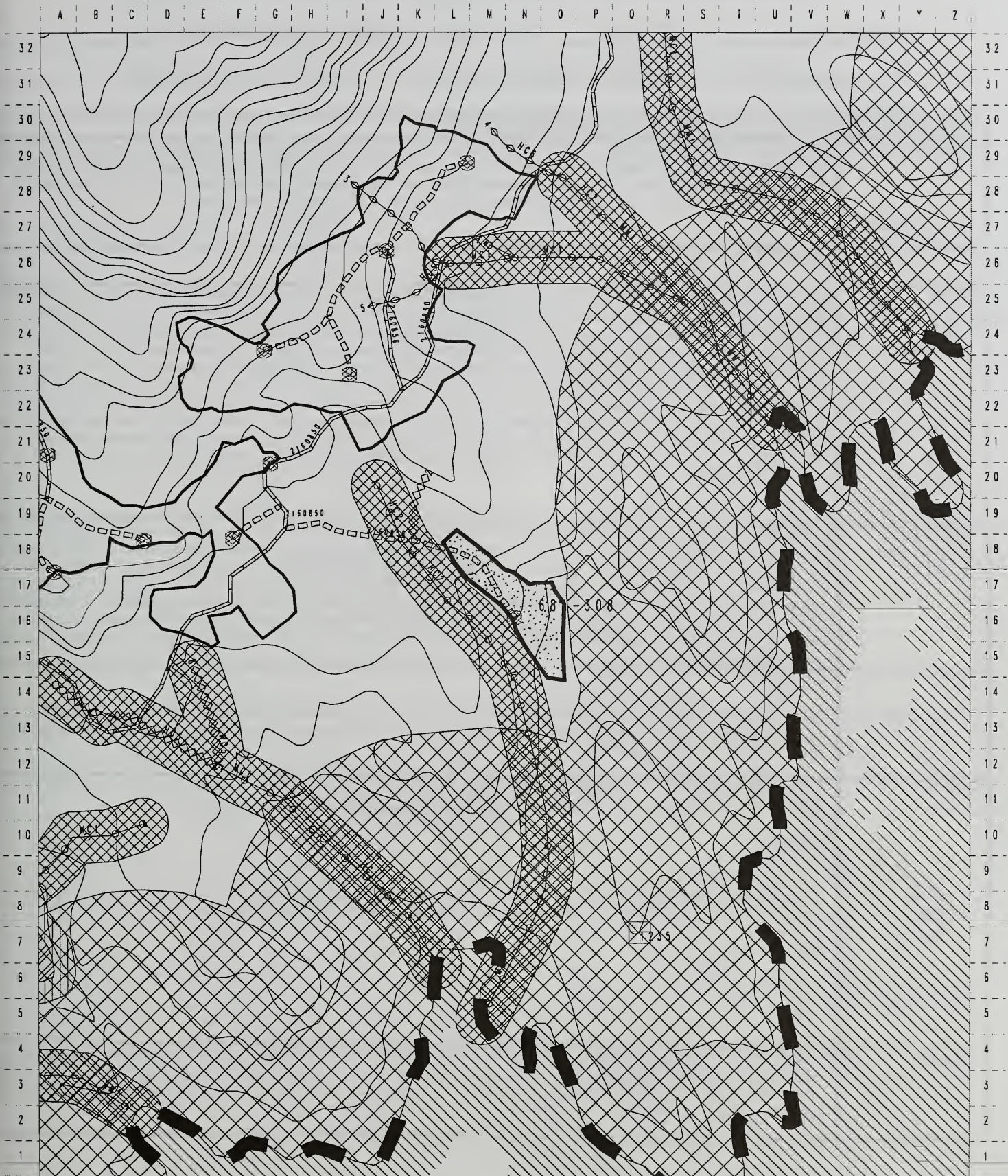
PHOTO YR/#: '72(53)-1872-31/'91(L46)-390-218 1/4 QUAD: KTN A-6 NW 1/4 LOGGING SYSTEMS: RS

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 68101-025, low windthrow risk. Productivity of site is low. Uneconomic, low volume area surrounding. Adjacent to estuary buffer. Dropped low volume area to the west and north. May not be economical if unit is at the end of a road.  |
| J. Oien 5/96  | ROADS: No concerns.  |
| R.Johnson<br>6/96   | SOILS/WATERSHED: Soils mapped 82D (McGilvery - Kitkun 35-60%) and 62 (Karheen - McGilvery 0-70%). Partial suspension for small portions of forested wetlands and McGilvery (BMPs 12.5, 13.9; TLMP 1997). Silviculture deleted W portion of unit, and moved east portion to S because of low volume wetlands (BMP 12.5). McGilvery and steep slopes reported in E portion. Protection of stream per fisheries (BMPs 12.6, 12.6a, 13.16). Deferred harvest on Kitkun and Karheen soils (TLMP 1997).  |
| K. Buckley, D.<br>Kuntzsch, B.<br>Freedman, M.<br>Greentree, 8/9/95 | FISHERIES: Stream 1 is a class I blue/ white stream that requires a 120' TTRA buffer (BMP 12.6).   |
| C.Tighe 8/96  | WILDLIFE:<br><br>This unit is within one-half mile of a known bald eagle nest. Road construction must be accomplished in accordance with the Bald Eagle Protection Act and must also comply with the MOU between the U.S. Fish and Wildlife Service and the Forest Service. Written coordination with the U.S. Fish and Wildlife Service must be documented. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This was not a priority unit for wildlife due to habitat requirements according to current goshawk protocol and as a result it was not surveyed in 1995 or 1996. Maintain 1000 foot estuary buffer. |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96   | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97   | PRESCRIPTION: Clear-cut w/ reserves: retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Beach buffer affects unit.   |



# Chosina Study Area Interim Layout N01 Unit 681-308

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

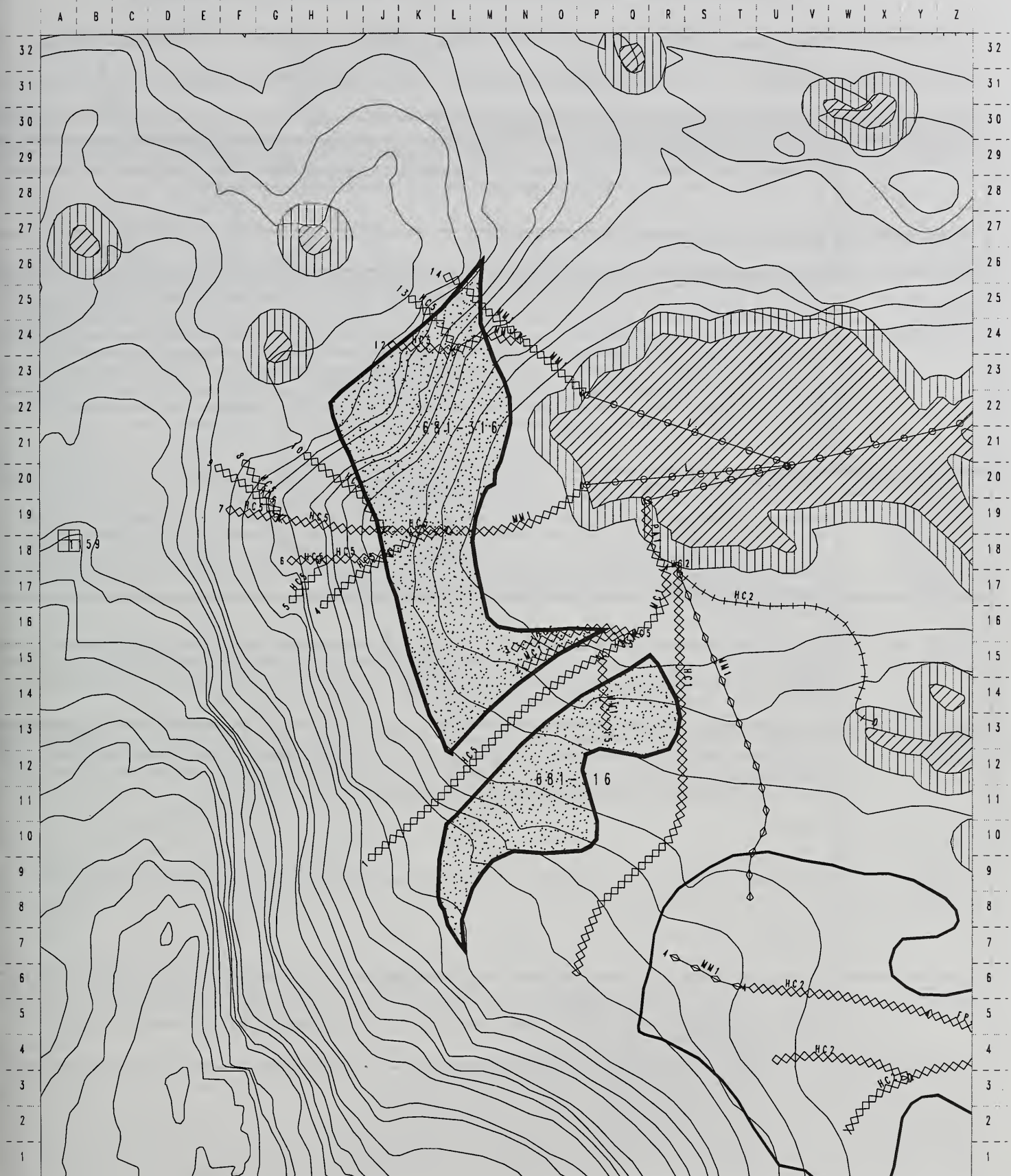
VCU-UNIT#: 681-316      ACRES: 36      VOL: 684      MBF      ALTERNATIVES: 2.6

PHOTO YR #: '91-390-144      1/4 QUAD: CRG A-1 NE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE                                       | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97                                   | SILVICULTURE/TIMBER: 68101-111, high windthrow risk, portion downhill yarded. Unit changed to provide proportionality of volume classes. Uneconomic, low volume area surrounding. Productivity of site is low / moderate. Partial cut buffer. <u>Suspension requirements</u> (see soils or fish). Maintain setting width between units. Keep unit below cliffs. Scrub buffer at the bottom. Option to road units 316 and 322 (private road connection). Road source at great distance.   |
| J. Oien 5/96  | ROADS: No concerns - needs soils input.  |
| Field<br>D.J.Landwehr<br>9/20/95<br>EIS R.Johnson   | SOILS/WATERSHED: Soils Tolstoi, StNicholas, Shakan, with Kitkun and McGilvery. Slopes 25-110%. Partial and full suspension required throughout the unit due to high MMI and McGilvery soils and many streams (BMPs 13.9, 13.16; TLMP 1997). About 15% forested wetlands. About 5 acres for helicopter yarding on the flat area above the cliff. The cable yarding backline should be placed at the base of the cliffs and very steep slopes on the west side of the unit. Approximately 4 acres on slopes greater than 75% gradient. Fourteen streams documented. Seven streams for O&W protection, and three for G&W protection (BMP 13.16). Fisheries identified 8 orange and white streams. The difference in the number and locatin of the streams will need to be reconciled during layout. The close proximity of streams in the southwest portion of the unit may preclude directional felling and split yarding. This area may need to be deleted. Karst per geology and fisheries. Potential add NW and W not feasible due to MMI 4 soils. Unit is in third order watershed H56A will have about 40-42% cumulative effect under alternatives 2 and 6 (BMP 12.1; TLMP 1997). Unit converted to helicopter yarding, should provide full suspension (BMP 13.9). Defer harvest on Kitkun soils (TLMP 1997). |
| K. McCartney, J.<br>Wrate, K. Buck-<br>ley, 8/15/95 | FISHERIES: Stream 1 is a class III orange/ white. Stream 2 is a class III orange/ white. Stream 3 is a class III green/ white. Stream 4 is a class III green/ white. Stream 5 is a class III green/ white. Stream 6 is a class III orange/ white. Stream 7 is a class III orange/ white (mistakenly flagged class II o/w). Stream 8 is a class III orange/ white. Stream 9 is a class III orange/ white. Stream 10 is a class III orange/ white. Stream 12 is a non-stream. Stream 13 is a class III green/ white. Stream 14 is a class III orange/ white. The class III orange/ white streams require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16). The class III green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16).   |
| C.Tighe 8-96  | WILDLIFE:<br><br>Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This unit did not rate out as a high priority unit for wildlife according to the current goshawk protocol for steepness and elevation and as a result it was not surveyed in 1995 or 1996.  |
| J.Baichtal<br>5/15/96                               | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Lower half of unit is moderate vulnerability karst. <u>Partial suspension required within karst portion of unit as a minimum.</u><br><br>LANDS:  |
| T. Fifield<br>10/28/96                              | CULTURAL: The unit was surveyed in 1996 due to its proximity to a high sensitivity zone for the occurrence of cultural resources. No cultural resources were noted in the unit. There are no concerns with the unit as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97                                   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut. Yard to private road system. "Unit added from preferred alternative due to proportionality based on acres." Helicopter yard with unit 681-322 for watershed cumulative effects.  |

# Chasina Study Area Interim Layout N01 Unit 681-316

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 681-322      ACRES: 47      VOL: 1340      MBF      ALTERNATIVES: 2,6

PHOTO YR/#: '91-390-143      1/4 QUAD: CRG A-1 NE 1 4      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 68101-107. low windthrow risk, portion downhill yarded. Unit changed to provide proportionality of volume classes. Productivity of site is moderate. <u>Suspension requirements</u> (see soils or fish). Maintain setting width between units. Option to road units 316 and 322 (private road connection). Rock source at a great distance.  |
| J. Oien 5/96  | ROADS: No concerns.   |
| Field<br>D.J.Landwehr<br>9/20/95<br>EIS R.Johnson   | SOILS/WATERSHED: Soils Mitkof, Kupreanof, McGilvery, Ulloa, Sarkar. Slopes less than 40%. Partial suspension required to protect thin soils over karst in the east part of the unit and McGilvery (BMP 13.9; TLMP 1997). About 25% forested wetlands. About 40% karst. Several areas in the unit may be suitable for shovel yarding depending on the final road location. One stream (31 in the fisheries report, starting at the V-notch) should be designated O&W (DF, SY or full over, and clean of introduced debris immediately) (BMP 13.16). One stream along the north boundary (#6 in the fish report) requires G&W protection (DF, SY or partial over, and clean before the end of the operating season). Three smaller streams (streams # 2, 3 and 4 in the fisheries report) do not warrant protection, but were given orange and white protection by fisheries and the differences will have to be reconciled during layout.. Unit is in third order watershed H56A which will have about 40-42% cumulative effect under alternatives 2 and 6 (BMP 12.1; TLMP 1997). Unit converted to helicopter yarding, which should provide full suspension (BMP 13.9). |
| K. McCartney, D.<br>Kuntzsch, J. Ba-<br>ichtal, K. Buck-<br>ley, 7/27/95<br>K. Buckley,<br>M. Solomon,<br>6/15/96 | FISHERIES: Stream 1 is a class IV green/ white, stream 1 changes to class III orange/ white at the V-notch below the unit. Stream 2 is a class III orange/ white. Stream 3 is a class III orange/ white. Stream 4 is a class III orange/ white. Stream 5 is a class III orange/ white. Stream 6 is a class IV green/ white. Streams 2, 3, and 4 flow into a karst sink hole. The lake on the south east corner of the unit requires a 100' no-cut water quality buffer (BMP 12.6). The class III orange/ white streams require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16).  |
| C.Tighe 8/96  | WILDLIFE:<br><br>To provide for adequate snag density and distribution within the VCU, recommend leaving a 0.1 acre or larger snag patch for each 10 acres of unit. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density. This unit did not rate out as a high priority unit for wildlife following the current goshawk protocol for steepness and elevation and as a result it was not surveyed during 1995 or 1996.   |
| J.Baichtal<br>5/15/96   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. About 40% of unit is underlain by moderate vulnerability karst. In the east end of the unit a 10' deep karst channel and sinkhole were located. <u>A 100 foot no harvest buffer</u> is required around the discrete features as per the standards and guidelines outlined in the RSDEIS for the TLMP. <u>Partial suspension required on the remainder of unit underlain by karst.</u>   |
| T. Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut. Unit added from the preferred alternative due to proportionality based on acres." Dropped 4 acres of scrub timber - option to road through private road system.   |

# Chosina Study Area Interim Layout NOI Unit 681-322

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

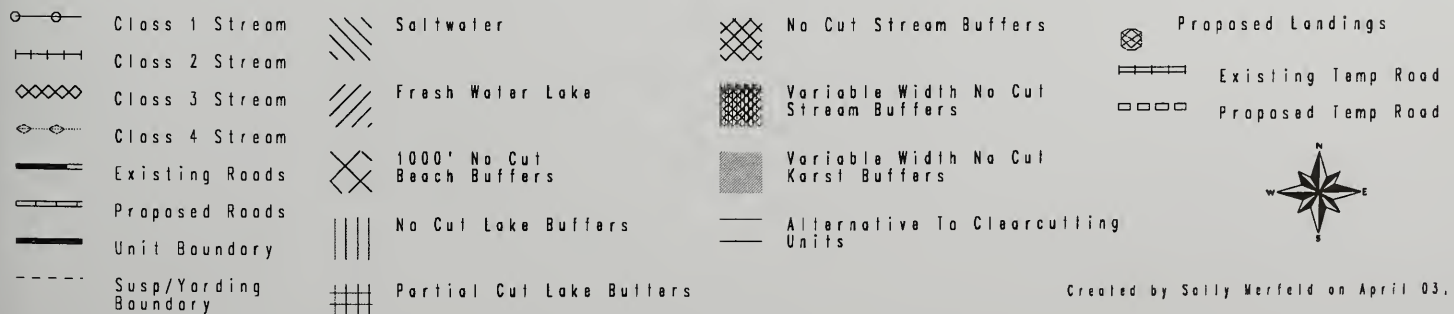
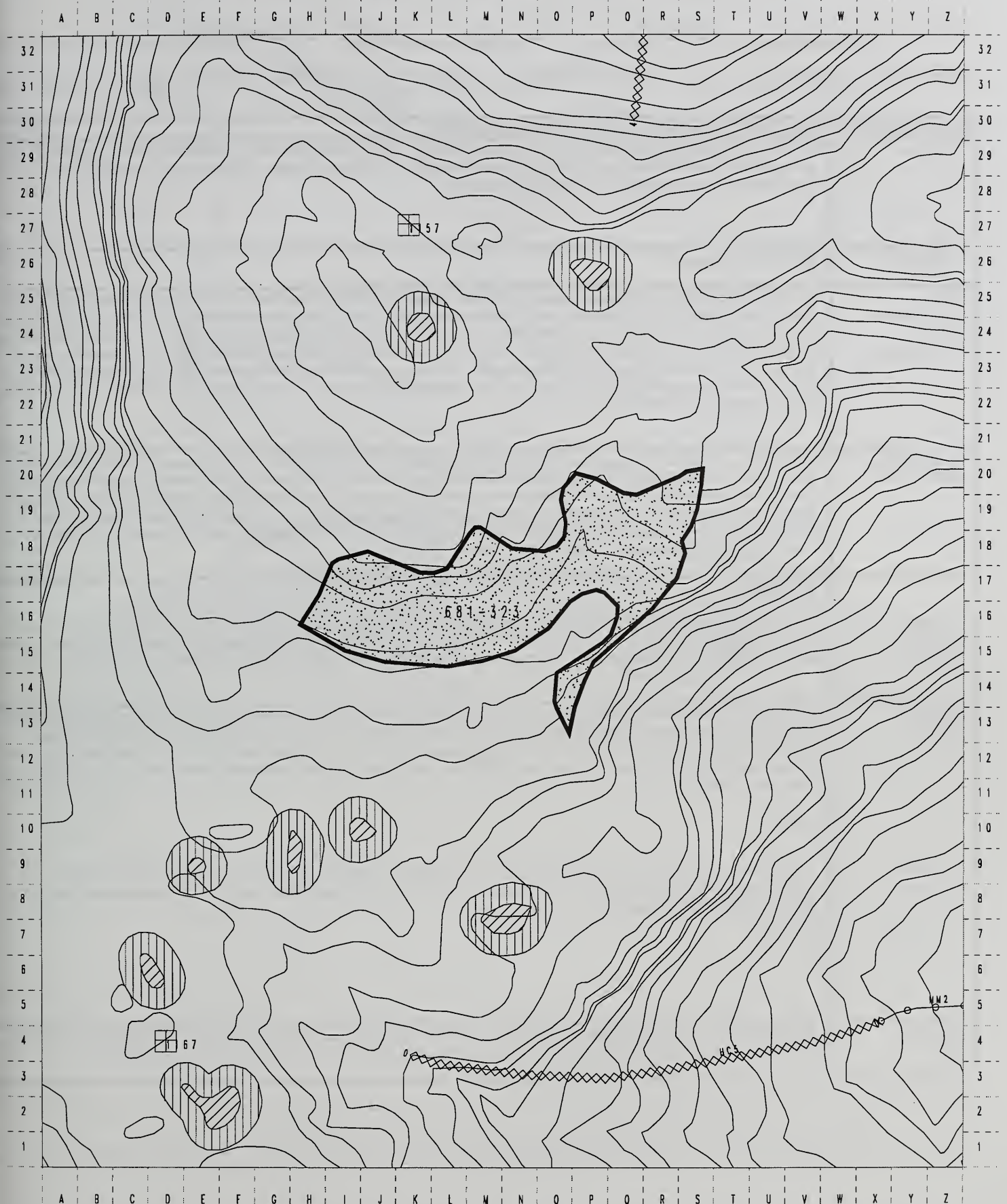
VCU-UNIT#: 681-323    ACRES: 21    VOL: 315    MBF    ALTERNATIVES: 6

PHOTO YR/#: '91-490-135    1/4 QUAD: CRG A-1    LOGGING SYSTEMS: HE

| REVIEWER&DATE         | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|-----------------------|---|
| G.Lawton<br>12/97     | SILVICULTURE/TIMBER: 68102-096, low windthrow risk. Productivity of site is low. Field checking alternative regeneration methods. Uneconomic, low volume area surrounding.  |
| J. Oien 5/96          | ROADS: No concerns.   |
| R.Johnson<br>6/96     | SOILS/WATERSHED: Soils mapped primarily 29EF (McGilvery 60-100%), with 90D (Grindall - Kitkun 35-60%), 4D (Helm 35-60%) and 43EFX (Shakan-McGilvery 60-150%). Probable deletion for McGilvery and slopes (BMP 13.5:TLMP 1997). <u>Possible low volume timber W half unit, may not be harvestable.</u> Possible headwater stream E half unit needing protection (BMP 13.16). Probable stream center of unit, not needing protection. Only minor expansion to N possible, but nowhere else to move unit as already on top of ridge and edge of tree line. <u>Probably not viable unit even with helicopter logging.</u> Unit is in third order watershed H56A, which will have about 42% cumulative effect under alternative 6 (BMP 12.1:TLMP 1997). Defer harvest on Kitkun soils (TLMP 1997). |
| K. Buckley, 7/96      | FISHERIES: Office review identified no fisheries concerns in the unit.  |
| C.Tighe 8/96          | WILDLIFE:<br><br>Wildlife did not survey this unit in 1995 or 1996. This unit is above the elevation criteria called for in the current goshawk protocol. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density.   |
| J.Baichtal            | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28.96 | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97     | PRESCRIPTION: <u>Clear-cut w/ reserves:</u> retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut.  |

# Chasina Study Area Interim Layout NOI Unit 681-323

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-332    ACRES: 26    VOL: 680    MBF    ALTERNATIVES: 6

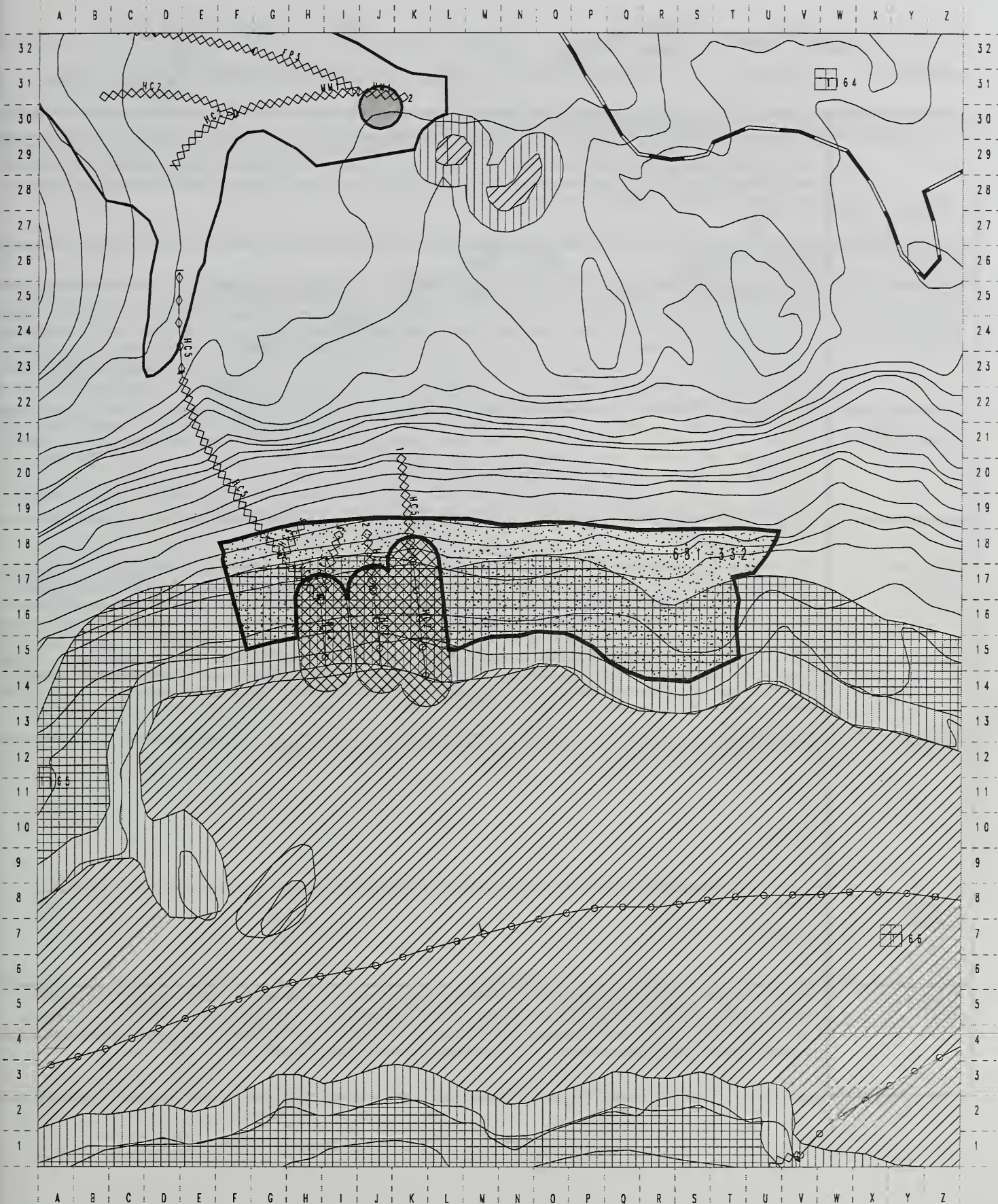
PHOTO YR/#: '91-390-142    1/4 QUAD: CRG A-1 NE 1/4    LOGGING SYSTEMS: HE

| REVIEWER&DATE                                     | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97                                 | SILVICULTURE/TIMBER: 68102-101, high windthrow risk, portion downhill yarded. Productivity of site is moderate. Partial cut buffer. Maintain setting width between units. Dropped top of unit (slides, etc.). Road connection could be from the private land to the east or Forest Service land from the south.   |
| J. Oien 5/96                                      | ROADS: No concerns.   |
| Field<br>D.J.Landwehr<br>9/21/95<br>EIS R.Johnson | SOILS/WATERSHED: Soil Sarkar, Tolstoi, McGilvery. Slopes 40-140%. Deleted above 500 feet due very steep, cliffs, landslides, MMI 4 (BMP 13.5). Remaining unit: A minimum of partial log suspension is required due to the presence of karst, McGilvery and high MMI soils (BMP 13.9; TLMP 1997). Two streams should be designated O&W (DF, SY or full suspension over and clean of introduced debris immediately) (BMP 13.16). Two streams should be designated G&W (DF, SY, or partial suspension over and clean before the end of the operating season). See fisheries section for a buffer prescription for Paul Lake (BMPs 12.6, 12.6a). Most of unit mixed karst. Unit is in third order watershed H56A which will have about 42% cumulative effect under alternative 6 (BMP 12.1; TLMP 1997). |
| K. McCartney, J. Wrate, 8/16/95                   | FISHERIES: Paul Lake will require a 150' no cut/ 350' partial cut TTRA buffer (BMP 12.6). Stream 1 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). At 260' of elevation stream 1 changes to a class III orange/ white. Stream 2 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). At 320' of elevation the stream changes to a class III orange/ white. Stream 3 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 4 is a class III orange/ white. Stream 5 is a class III orange/ white. The class III orange/ white require directional falling, and split yarding or full suspension. Clean streams of introduced debris immediately (BMP 13.16).   |
| A.Mueller,<br>B.Johnston<br>7/18/96               | WILDLIFE:<br><br>This unit did not rank as a high priority unit for wildlife. The steepness of the unit is above that which is called for in the current goshawk protocol. It was not surveyed by wildlife in 1995. Deer sign was noted in the unit. Down woody debris seen throughout unit. Wildlife recommends leaving live reserve trees and snags where possible to maintain habitat structure and snag density.  |
| J.Baichtal<br>5/15/96                             | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. Unit on interbedded marble and schist. Extremely steep slopes above approx. 500' elevation. Resurgences appear at about this elevation as well. Sinkhole in northeast corner of unit. High vulnerability karst above the 500' elevation and should be excluded from the unit as per the standards and guidelines outlined in the RSDEIS for the TLMP. Moderate vulnerability karst below 500' elevation, partial suspension required.   |
| T. Fifield<br>10/28/96                            | LANDS:<br><br>CULTURAL: This unit was surveyed in 1996 due to its proximity to a high sensitivity zone for the occurrence of cultural resources. Spring board stumps were noted in the unit. However, no significant cultural resources were encountered. There are no concerns with the unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                                 | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut.   |



# Chosina Study Area Interim Layout NOI Unit 681-332

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-363      ACRES: 31      VOL: 1178      MBF      ALTERNATIVES: 2, 3, 6

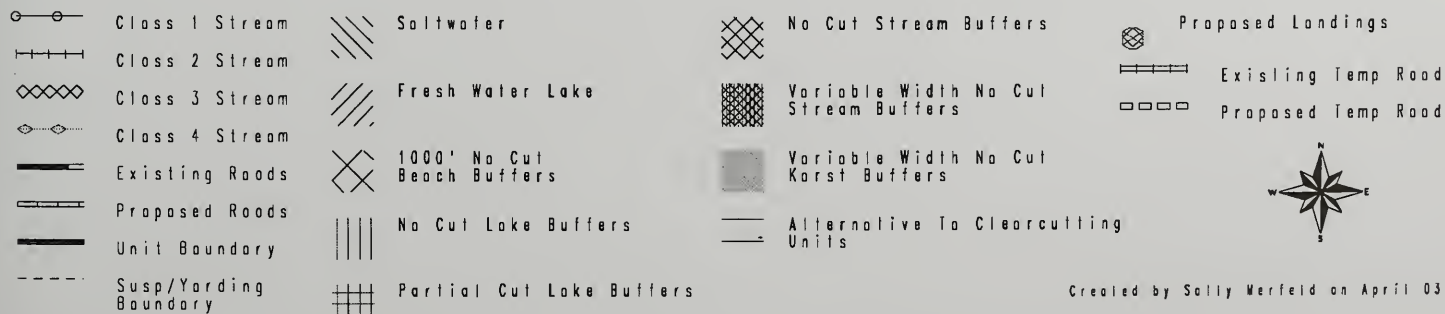
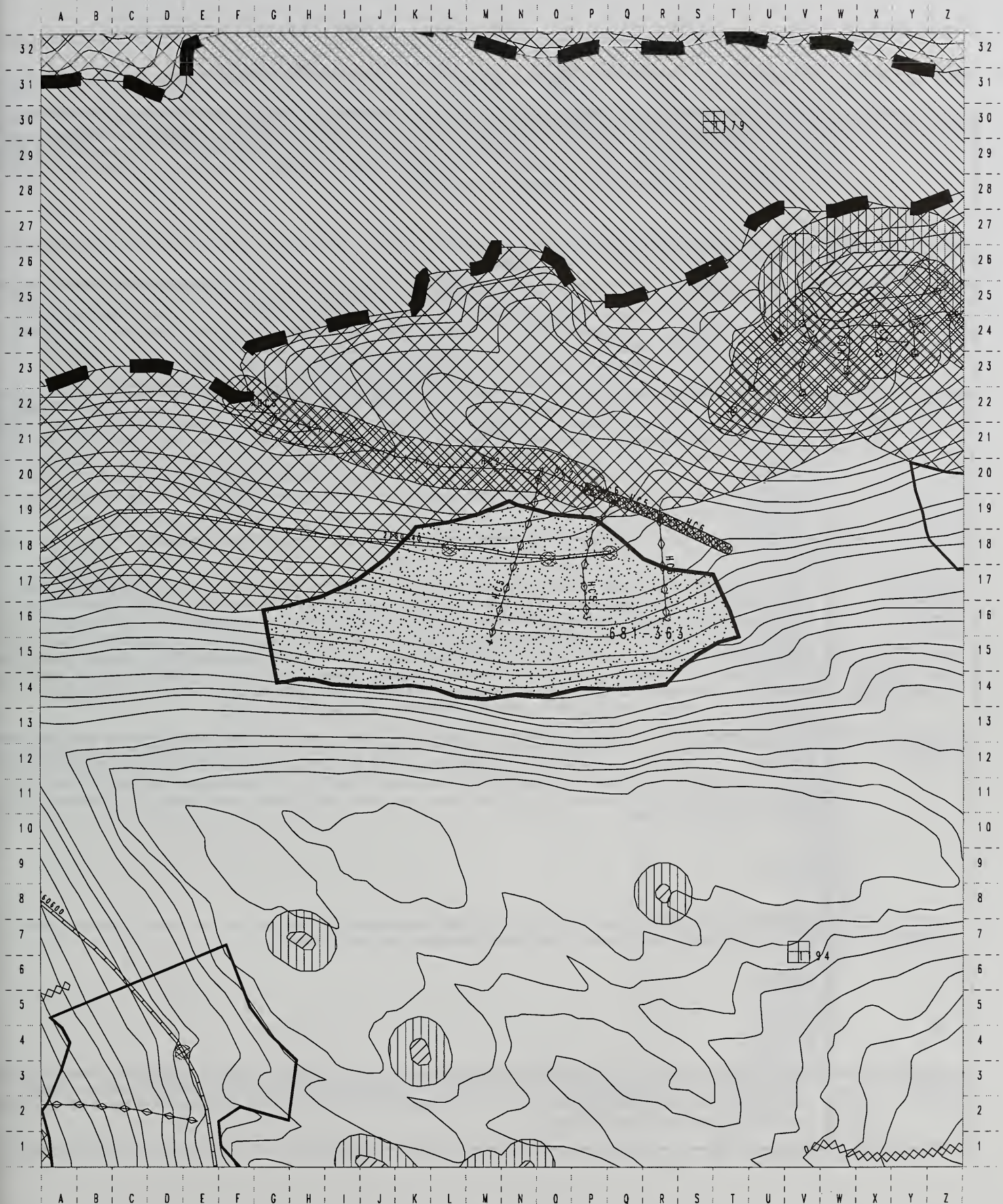
PHOTO YR/#: '91-390-170 1/4 QUAD: CRG A-1 SE 1/4 LOGGING SYSTEMS: SL/HE

| REVIEWER&DATE                                     | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97                                 | SILVICULTURE/TIMBER: 68102-33, high windthrow risk, portion downhill yarded, high mistletoe present. Retain stand structure for wildlife where feasible. Productivity of site is high. Partial cut buffer. Uneconomic, low volume area east & west ends. Drop cliffs on top. Cliffs in center of unit may force 2/3 of unit into helicopter yarding. Maintain setting width between units. Option: helicopter. Not an estuary buffer.  |
| J. Oien 5/96                                      | ROADS: No concerns.  |
| field<br>D.J.Landwehr<br>8/22/95<br>EIS R.Johnson | SOILS/WATERSHED: Upper boundary at 800' elevation. Elevations were measured in the field and may not correspond to those shown on the unit map. Minimum of partial suspension in areas that can be cable logged (BMP 13.9). May need to helicopter yard upper reaches of unit because of small cliffs, steep slopes and McGilvery (BMPs 13.9, 13.5; TLMP 1997). Exclude very steep slopes, cliffs, and McGilvery below 800' from clearcutting. Road in lower portion of unit only accesses 200 to 400 foot corridor; upper reaches of unit largely inaccessible from proposed road (BMP 14.2). Proposed action to helicopter yard is desirable to protect watershed resources (BMP 13.9). Protection of four streams per fisheries (BMP 13.16). Additional information is filed in the reconnaissance folder. Minor amounts of Kitkun soils present (TLMP 1997).   |
| J. Hannon, M.<br>Becker, 6/28/95                  | FISHERIES: Stream 1 is a class II blue/ white that requires a 100' TTRA buffer and a 25' buffer where stream becomes a class III orange/white (BMP 12.6). Stream 2 was a class III green/ white, under the new TLMP (1997) standards stream 2 is a class IV green/ white. Stream 3 was a class III green/ white, under the new TLMP (1997) standards stream 3 is a class IV green/ white. Stream 4 was a class III green/ white, under the new TLMP (1997) standards stream 4 is a class IV green/ white. The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris before the end of the operating period or before the yarder leaves the area (BMP 13.16).   |
| M.Dillman,<br>J.Wrate<br>6/28/95                  | WILDLIFE:<br><br>Deer and bear sign seen in unit. Unit occurs in an important wildlife travel corridor. Therefore, wildlife recommends partial harvest to maintain forest structure to lessen impact on wildlife migration and dispersal. Unit is within one-quarter mile of a bald eagle nest. Therefore road construction activity may be restricted in accordance with the Bald Eagle Protection Act and coordination with the U.S. Fish and Wildlife Service must be documented. Also the MOU between the U.S. Fish and Wildlife Service and the U.S. Forest Service concerning bald eagle nests must be followed. The unit is also being considered for helicopter harvest and the nest location may impact fly/drop zones. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density if unit is not partial cut. This unit was not surveyed in 1996. The unit is over the steepness criteria called for in the current goshawk protocols. The final definition of an estuary and the buffer requirements on them may affect the acreage of this unit. As it is currently mapped in GIS the northwest corner, about 1/5 of the unit is in an estuary buffer. |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concern.   |
| T.Fifield<br>10/28/96                             | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97                                 | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type B clear-cut, use estuary buffer as retention. Minimum partial suspension. Exclude very steep cliffs, McGilvery soils. Unit added to the preferred alternative due to proportionality based on acres. 1/2 unit dropped for beach buffer. Monitor for PCT at 25+ years.  |



# Chasina Study Area Interim Layout N01 Unit 681-363

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-365      ACRES: 7      VOL: 175      MBF      ALTERNATIVES: 2, 3, 4, 6

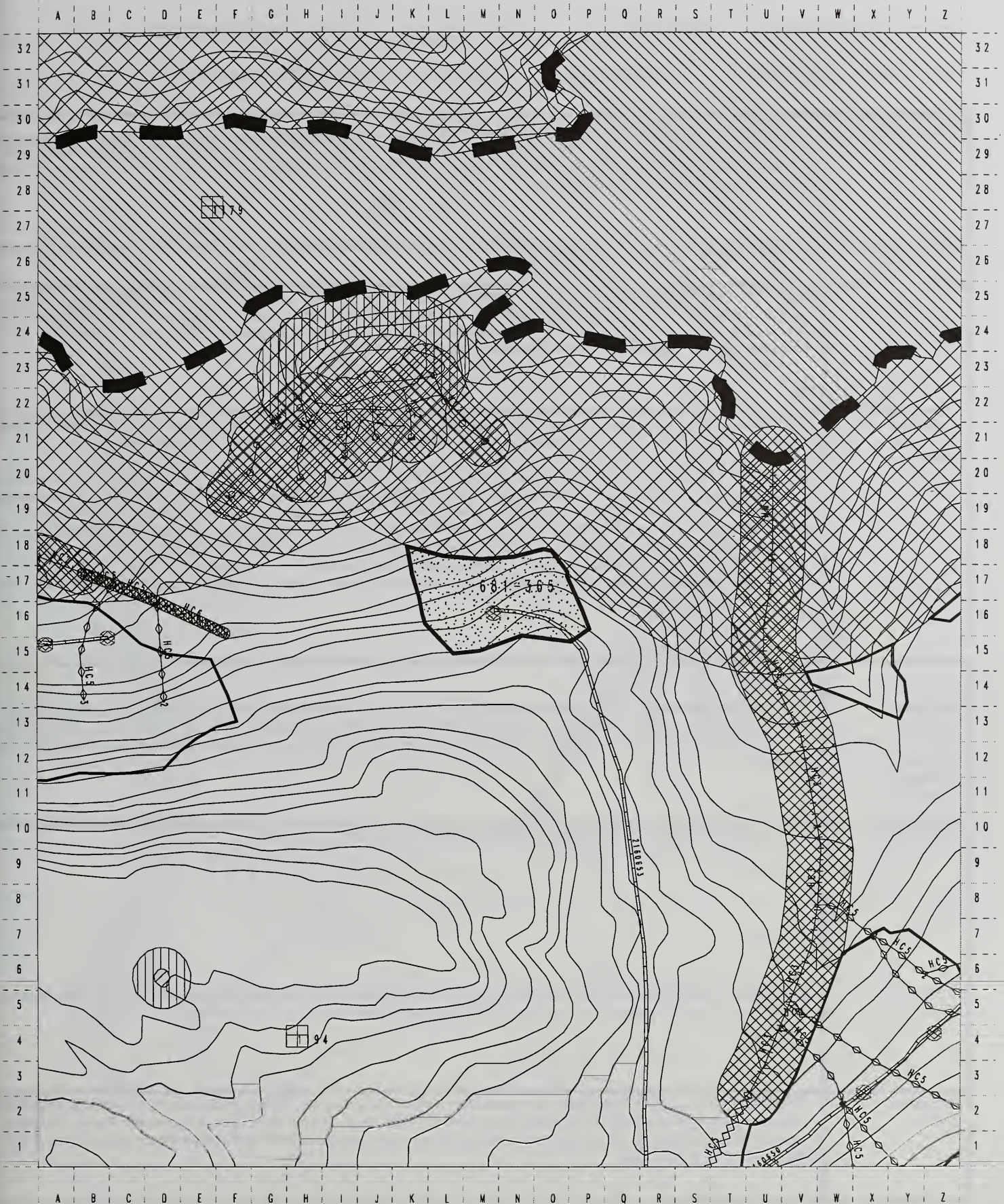
PHOTO YR/#: '91-390-170      1/4 QUAD: CRG A-1 SE 1/4      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 68102-030, high windthrow risk. Maintain setting width between units. <u>Stay out of estuary buffer.</u> Partial cut buffer. Productivity of site is moderate. Portion of unit dropped due to lake. If road comes from the east from above, visually try to keep strip slightly NW. Option: helicopter yarding.  |
| J. Oien 5/96  | ROADS: Difficult roading - no concerns.   |
| D.J.Landwehr<br>8/25/95<br>R.Johnson<br>5/31/96   | SOILS/WATERSHED: Steep areas and McGilvery on the east and west sides of the unit will be reviewed during layout (BMPs 13.1, 13.5 ; TLMP 1997). Partial suspension for inclusions of forested wetlands and McGilvery in the remaining bowl (BMPs 12.5, 13.9; TLMP 1997). Upper backline should be about 550' elevation. Elevation was measured in the field and may not correspond to those shown on the unit map. Proposed helicopter yarding is preferred because of potential problems with the 2160-653 road (BMP 14.2). Streams have been largely eliminated from unit and should be protected by suspension (BMP 13.16). Additional information is filed in the reconnaissance folder. Minor amounts of Kitkun and Kaikli soils present (TLMP 1997).  |
| J. Hannon, M.<br>Becker, 6/28/95  | FISHERIES: Lake is a class I blue/ white adfluvial that requires a 200' TTRA buffer (BMP 12.6). Stream 1 is a class III orange/ white that requires directional falling, and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). Recommend that the unit boundary be above the slope break of this stream. Stream 2 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 3 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 4 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 5 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Stream 7 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). None of these stream are within the unit boundaries.   |
| M.Dillman,<br>J.Wrate, M.<br>Pacheco<br>6/29/95<br>M.Dillman<br>7/96 T.Belfield,<br>C.Tighe 7/27/96 | WILDLIFE:<br><br>Game trails/deer sign seen in unit. Lake found in unit. Karst in unit/cave located. Bald eagle nest found. Road construction activities may be restricted in accordance with the Bald Eagle Protection Act and all coordination with the U.S. Fish and Wildlife Service must be documented. The MOU between the U.S. Fish and Wildlife Service and the U.S. Forest Service concerning eagle nests must also be followed. If this unit is harvested by helicopter the eagle nest location may impact drop zones. The acreage may be affected depending on the final definition of an esuary buffer. As it is currently mapped in GIS the northeast corner of the unit would have to be dropped to meet the estuary buffer requirements. Sharp-shinned hawks were found in this unit. There were two birds seen, both young, and two birds heard. Sensitive plant surveys were conducted in this unit. <u>Platanthera chorisia</u> , the choris bog orchid, a species on the sensitive plant list, was found in the vicinity of this unit. |
| J.Baichtal<br>5/15/96   | GEOLOGY/MINERALS: No minerals concerns, access for harvest will improve mineral exploration access. A low elevation karst ridge runs along the north shore of the lake and into the northeast end of the unit. A small cave inside lake buffer. Outlet stream of lake flows into sinkhole and resurges a short distance later. Epikarst is well developed atop the ridge in the unit (Soils Report). Karst ridge should be excluded from the unit based on epikarst development as per the standards and guidelines outlined in the RSDEIS for the TLMP.<br><br>LANDS:  |
| T. Fifield<br>10/28/96  | CULTURAL: Although scheduled for survey in 1996, field inspection indicated this unit was very unlikely to contain cultural resources. No survey was conducted. There are no concerns with this unit as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: Full suspension required; recommend unit deletion due to presence of very thin McGilvery soils. Clearcut with reserves: retain 10-20% of cutting unit, where safe and feasible. Use type C clearcut. Delete for beach buffer, steep McGilvery soils. MONitor for PCT at 25+ years.  |



# Chosina Study Area Interim Layout NOI Unit 681-365

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative to Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-367 ACRES: 16 VOL: 240 MBF ALTERNATIVES: 2, 3, 4, 6

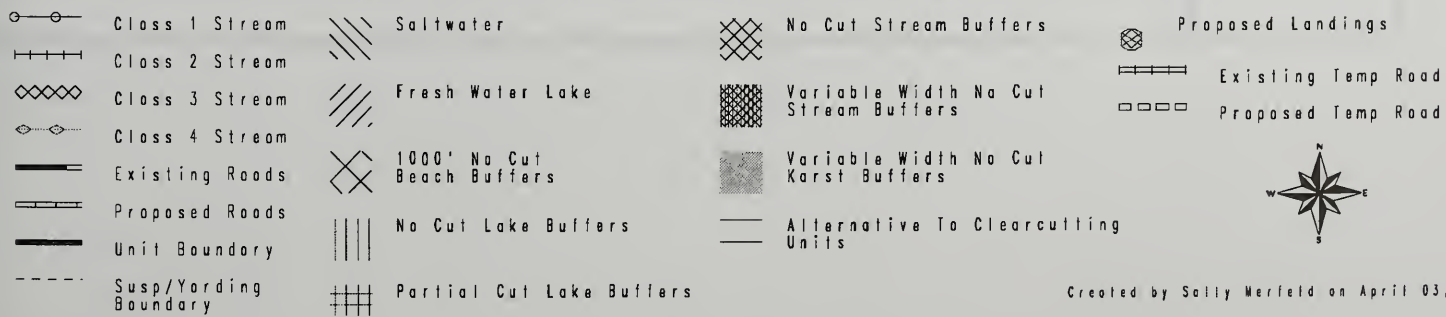
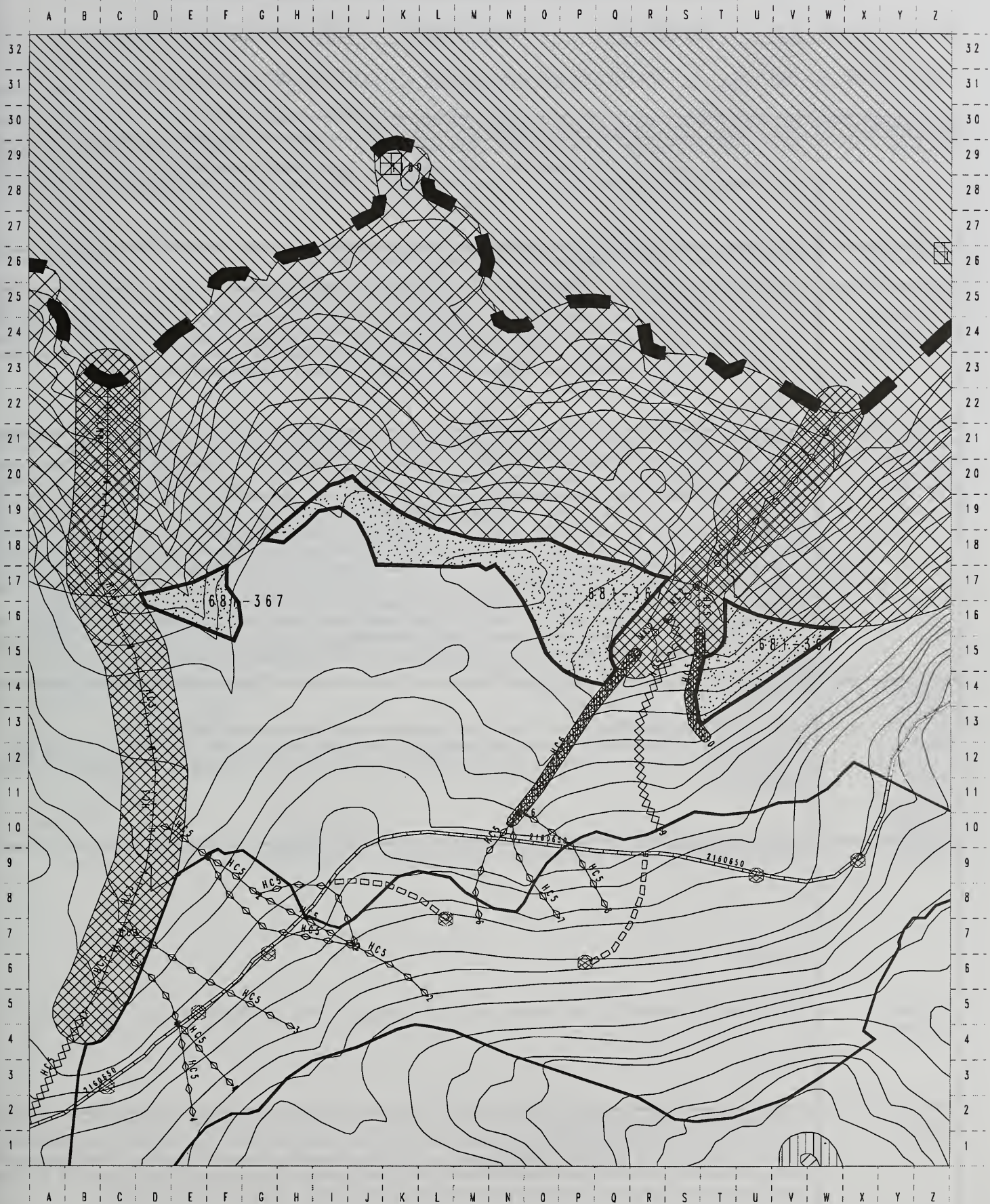
PHOTO YR/#: '91-390-170 1/4 QUAD: CRG A-1 SE 1/4 LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|---|---|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 68102-26, high windthrow risk. Productivity of site is low. 1/2 of unit is within estuary buffer. Partial cut buffer. Maintain setting width between units. If road comes from above, could use strip corridors. Uneconomic, low volume area surrounding. Option: helicopter.  |
| J. Oien 5/96  | ROADS: Difficult access - some concerns.  |
| Field<br>D.J.L.andwehr<br>8/28/95<br>EIS R.Johnson                                | SOILS/WATERSHED: Partial suspension for MMI3 and thin soils (BMP 13.9; TLMP 1997). Addition below large cliff previously in northeast portion of unit 681-368, needs full or good partial suspension to mitigate landslide and protect soil productivity (BMPs 13.5, 13.9). Protection of streams per fisheries (BMP 12.6a). Minor amounts of Kaikli soil present (TLMP 1997). Additional information is filed in the reconnaissance folder.  |
| J. Hannon,<br>M. Becker<br>6/24/95  | FISHERIES: Stream 1 is a class II orange/white that requires a 100' AHMU buffer up to 80' of elevation. Above this the stream has a short length of Class III that is lumped into the Class II section below the unit. Near the unit, the stream requires a 150' buffer (BMP 12.6).<br>East parts of unit ( old unit 681-368) Stream 1 is a class II orange/ white that will require a 150' AHMU buffer near the unit (BMP 13.16). Stream 2 was a class III green/ white, under the new TLMP (1997) standards stream 2 is a class IV green/ white. Stream 6 is a class I blue/ white that requires a 120' TTRA buffer (BMP 13.16). Above 180' of elevation stream 6 is a class III orange/ white that requires a 100' buffer (BMP 13.16), and then stream 6 requires a slope break buffer. The west slope break of stream 6 should be the unit boundary. Stream 10 is a class I blue/ white that requires a 120' TTRA buffer (BMP 12.6). Above 130' of elevation stream 10 is a class III orange/ white. The east slope break of stream 10 should be the unit boundary.<br>The orange/ white streams require directional falling, split yarding or full suspension, and immediate cleaning of introduced debris from the channel (BMP 13.16). |
| M.Dillman,<br>J.Wrate, M.<br>Pacheco 6/29/95<br>C.Tighe,<br>B.Johnston<br>5/31/96 | WILDLIFE:<br><br>Game trails and bear sign in unit. Wolf scat seen in muskeg above unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. The acreage of this unit may be affected depending on the final definition of an estuary buffer. As the unit is currently mapped in GIS, and with the current estuary buffer definition, the western half of the unit needs to be dropped.   |
| J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br>LANDS:   |
| T.Fifield<br>10/28/96   | CULTURAL: Although scheduled for survey in 1996, field inspection indicated that this unit was unlikely to contain cultural resources (very steep). No survey was conducted. There are no concerns with the unit as planned.<br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Uneven-aged Mgmt</u> ; for regeneration and structure retention. Strip corridors selection if cable yarding uphill. Helicopter yarding is an option with overstory removal of 16" DBH limit. A lot of scrub (12 acres dropped). Partial suspension required throughout unit for soils protection. Combine the helicopter portions of 367& 368. Buffer (beach) deletes most of unit. Monitor for PCT at 25+ years.  |



# Chasina Study Area Interim Layout NOI Unit 681-367

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-368      ACRES: 96      VOL: 2503      MBF      ALTERNATIVES: 2, 3, 4, 6

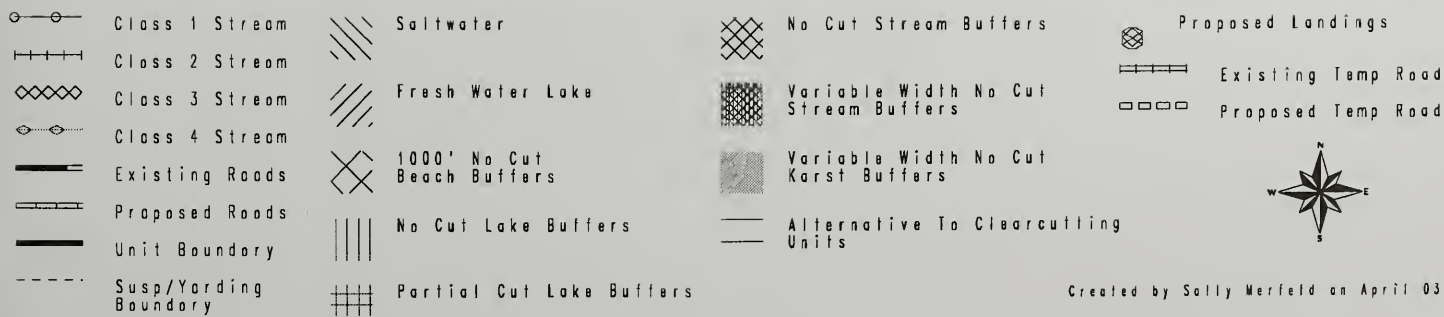
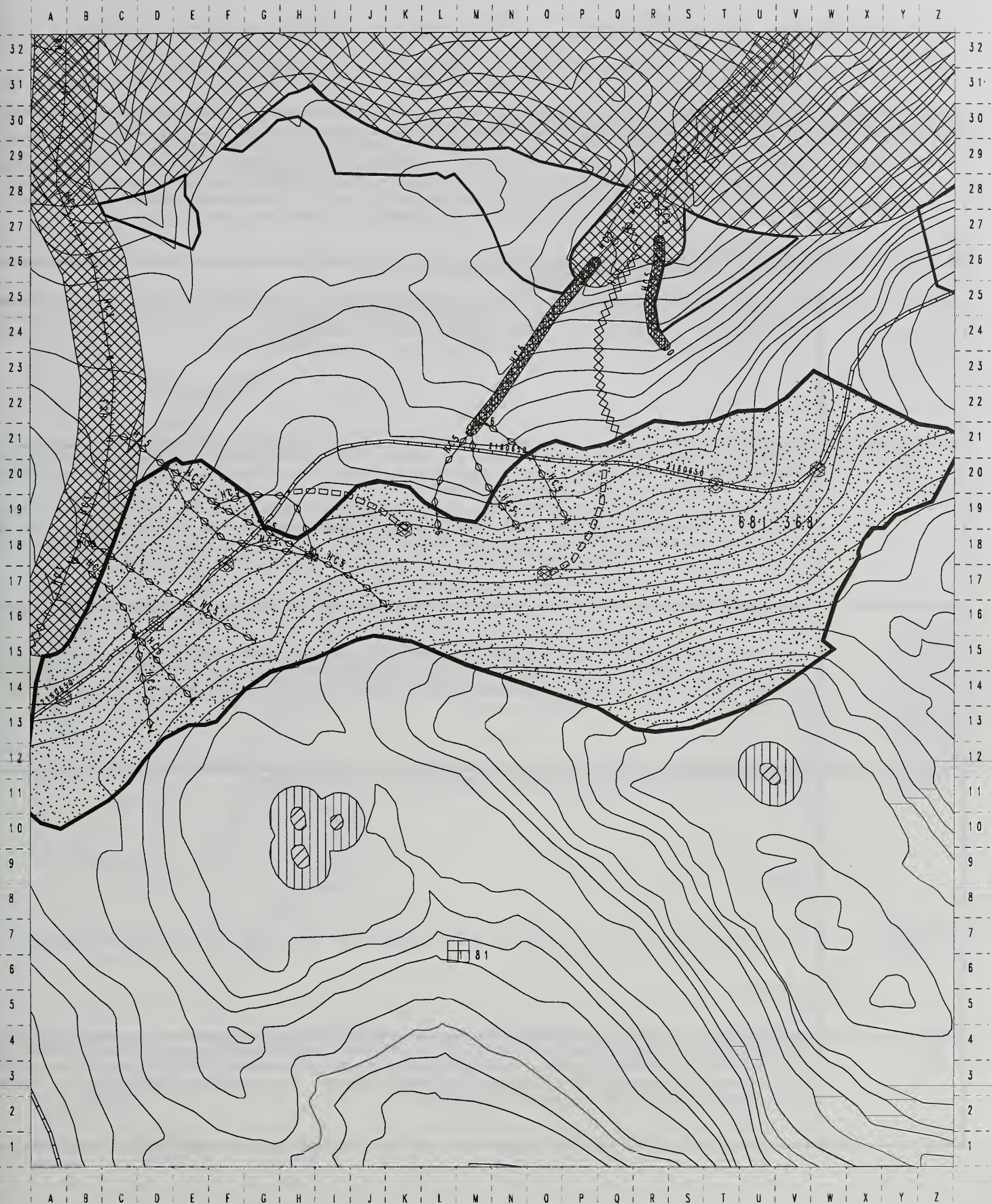
PHOTO YR/#: '91-390-170      1/4 QUAD: CRG A-1 SE 1/4      LOGGING SYSTEMS: SL /HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 68102-020 & 122, high windthrow risk. Productivity of site is moderate. Split-yarding required on stream. Partial cut buffer. Maintain setting width between units. Center portion dropped for stream braiding. Reach as high as possible upslope for downhill yarding. Lower may not be feasible with extensive road building. Option: helicopter yarding.   |
| J. Oien 5/96   | ROADS: minimal timber - Recommend helicopter logging for these units.  |
| Field<br>D.J.Landwehr<br>8/24/95<br>EIS R.Johnson  | SOILS/WATERSHED: A minimum of partial suspension for MMI3 soils, McGilvery soils, and steep slopes (BMPs 13.9, 13.5; TLMP 1997). McGilvery predominates in the upper portion of the unit and will be reviewed during layout. Minor amounts of Kitkun and Kaikli soils present (TLMP 1997). Protection of streams per fisheries, plus put slope break buffers above fish habitat on the two main creeks and on portions of two tributaries because of MMI4 soils (BMPs 12.6a, 13.5). Additional roading may be needed for partial suspension (BMP 14.2). Additional information is filed in the reconnaissance folder.  |
| J. Hannon,<br>M. Becker,<br>6/29/95  | FISHERIES: Stream 1 is a class II orange/ white that will require a 150' AHMU buffer (BMP 13.16). Stream 2 was a class III green/ white, under the new TLMP (1997) standards stream 2 is a class IV green/ white. Stream 3 was a class III orange/ white (mistakenly flagged green/ white), under the new TLMP (1997) standards stream 3 is a class IV orange/ white. Stream 3 should be flagged orange/ white to provide additional resource protection. Stream 4 has two forks, the east fork was a class III green/ white, the west fork was a class III orange/ white. Under the new TLMP (1997) standards the east fork should be a class IV green/ white, and the west fork a class IV orange/ white. The west fork of stream 4 is flagged orange/ white to provide additional resource protection. Stream 6 was a class III green/ white, under the new TLMP (1997) standards stream 6 is a class IV green/ white. Stream 7 was a class III orange/ white, under the new TLMP (1997) standards stream 7 is a class IV orange/ white. Stream 7 is flagged orange/ white to provide additional resource protection. Stream 8 was a class III orange/ white, under the new TLMP (1997) standards stream 8 is a class IV orange/ white. Stream 8 is flagged orange/ white to provide additional resource protection. The orange/ white streams require directional falling, and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| D.Parker,<br>J.Wrate,<br>C.Crocker-<br>Bedford,<br>M.Pacheco<br>7/5/95<br>C.Tighe,<br>A.Mueller<br>6/21/96 | WILDLIFE:<br><br>Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density.<br>6/21/96 Pygmy owl heard in unit at goshawk calling station #2. Good wildlife snags in southern part of unit. Deer sign, beds, pellets seen in unit. Game trails throughout unit. Rocky ridge on south side of unit. Wolf heard in area of muskeg to the south-west of the unit.  |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br>LANDS:  |
| T.Fifield<br>10/28/96  | CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type B clear-cut, use buffers as retention. Soils to look at. Minimum of partial suspension. Full suspension addition below cliff northeast. Should delete upper portion of unit due to McGilvery soils (compliance with TLMP 1991). Helicopter lower portions to combine into 368. Drop lower road. Many stream buffers. May have to helicopter the upper southern portion. Too isolated for PCT in future.   |



# Chosina Study Area Interim Layout NOI Unit 681-368

Mapscale 1:7920 (8 inch to Mile)





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 681-372      ACRES: 23      VOL: 653      MBF      ALTERNATIVES: 2, 3, 6

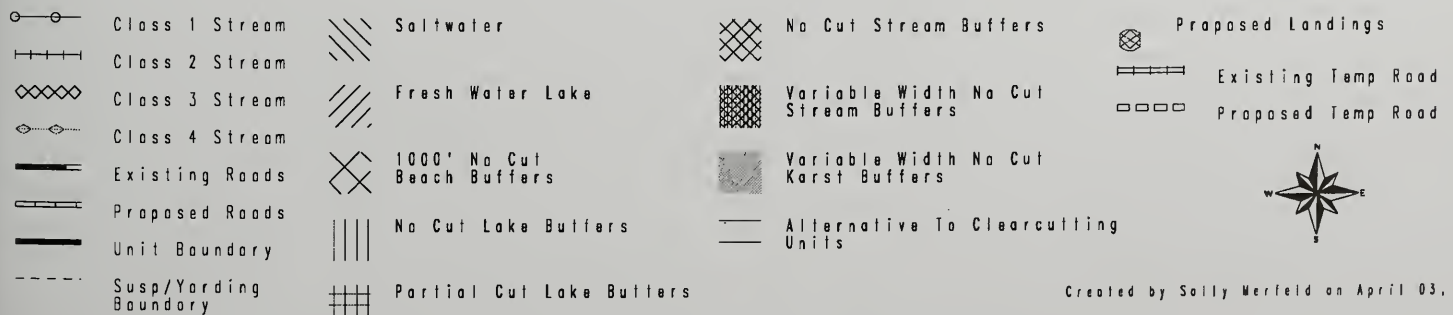
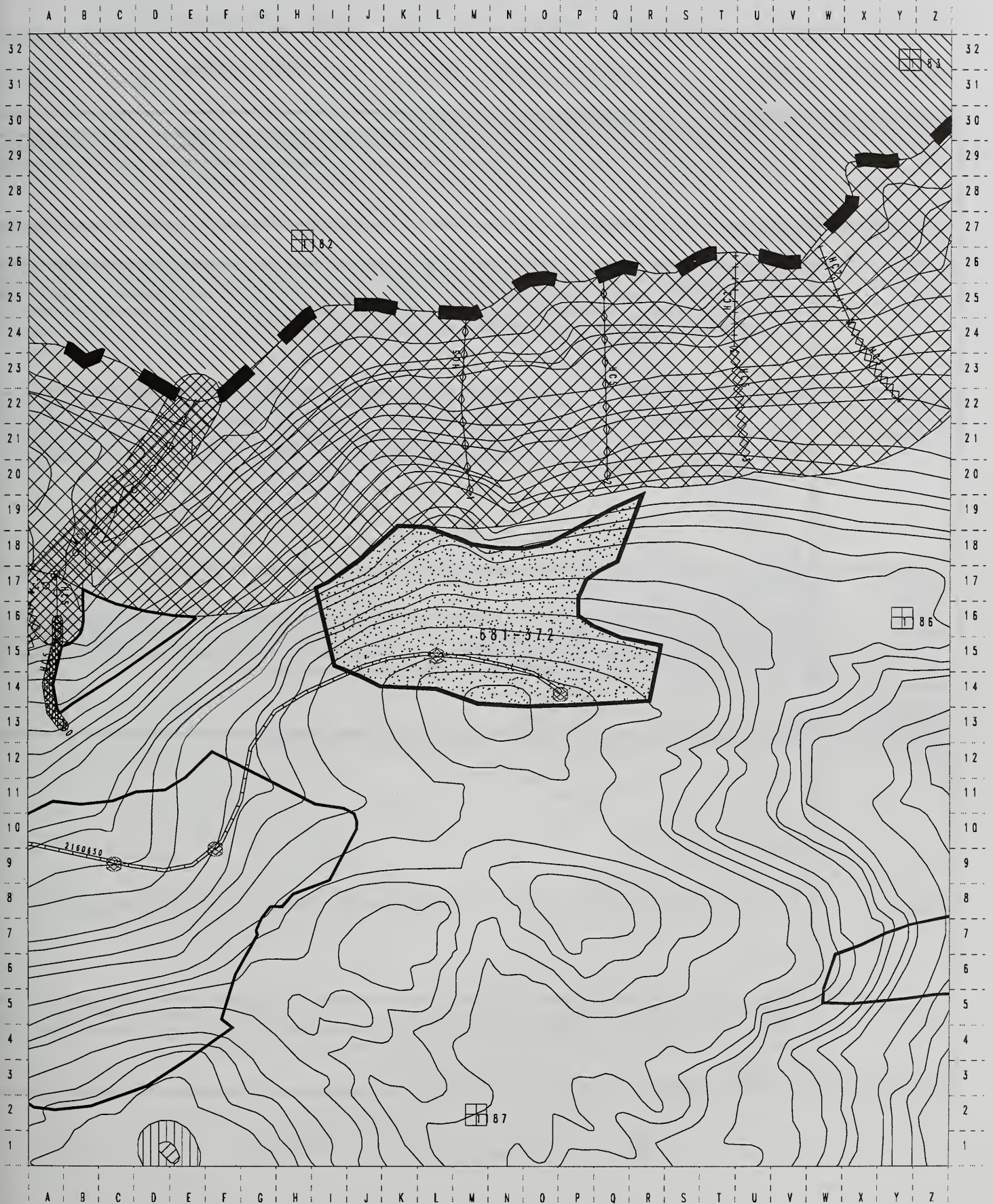
PHOTO YR/#: '91-390-213 1/4 QUAD: CRG A-1 SE 1/4 LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 68101-12, high windthrow risk. Unit changed to provide proportionality of volume classes. Productivity of site is moderate. Stay out of estuary buffer. Helicopter yarding method above cable reach of lower unit, adjust bdry accordingly. Due to helicopter at lower end below cliffs (681-383). Keep off of cliffs. Uneconomic, low volume area east tip. Suspension requirements (see soils or fish). Visual concerns could be lowered by retaining trees in area above cliffs. Spruce promoted by exposed soils. Option: helicopter, strip corridors. Several acres dropped due to estuary buffer.   |
| J. Oien 5/96  | ROADS: No concerns - road costs high for last 1/2 mile of road access.   |
| Field<br>D.J.Landwehr<br>9/15/95<br>EIS R.Johnson                                   | SOILS/WATERSHED: Minimum of partial suspension required on the minor amounts of McGilvery, MMI3, and forested wetlands (BMPs 12.5, 13.9; TLMP 1997). Minor amounts of Kitkun soil present (TLMP 1997). Keep slash out of the dry V-notch on the west boundary (BMP 13.16). Additional information is filed in the reconnaissance folder.   |
| J. Hannon,<br>J. Wrate,<br>6/30/95  | FISHERIES: Stream 1 was a class III orange/ white, under the new TLMP (1997) standards stream 1 is a class IV orange/ white. Stream 1 is flagged orange/ white to provide additional resource protection. Stream 2 was a class III green/ white, under the new TLMP (1997) standards stream 2 is a class IV green/ white.<br>The orange/ white streams require directional falling, split yarding or full suspension, and immediate cleaning of introduced debris (BMP 13.16). The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). There is a 1000' beach buffer adjacent to this unit that contains stream 1 and 2. Streams 1 and 2 are not within the unit boundaries. |
| J. Wrate,<br>J.Hannon<br>6/30/95<br>C.Tighe,<br>A.Mueller,<br>B.Johnston<br>7/25/96 | WILDLIFE:<br><br>Game trails, deer sign, and bear sign seen in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. The acreage of this unit may be slightly effected depending on the final definition of an estuary and its buffer requirements. As this unit is mapped in GIS and using the current estuary buffer definition the unit will lose the northwestern tip.   |
| J.Baichtal<br><br><br><br><br><br><br><br><br><br>T.Fifield<br>10/28/96             | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br><br><br><br><br><br><br><br><br>LANDS:<br><br><br><br><br><br><br><br><br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br><br><br><br><br><br><br><br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: Clear-cut w/ reserves; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Soils to look at. Minimum partial suspension. Keep slash out of dry V-notch W boundary. Should delete almost all of the unit above the cliff for compliance with McGilvery soils protection (TLMP 1991).   |



# Chasina Study Area Interim Layout NOI Unit 681-372

Mapscale 1:7920 (8 inch to Mile)





## CHASINA PROJECT HARVEST UNIT DESIGN CARD

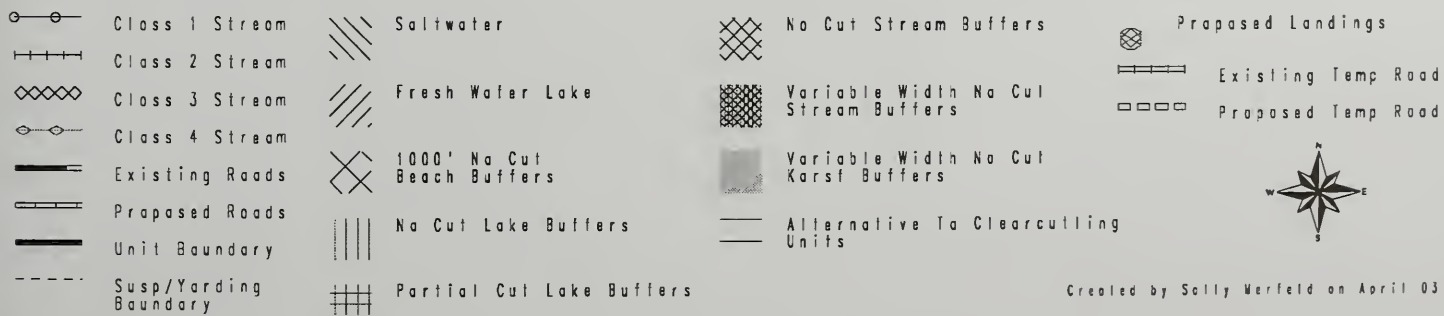
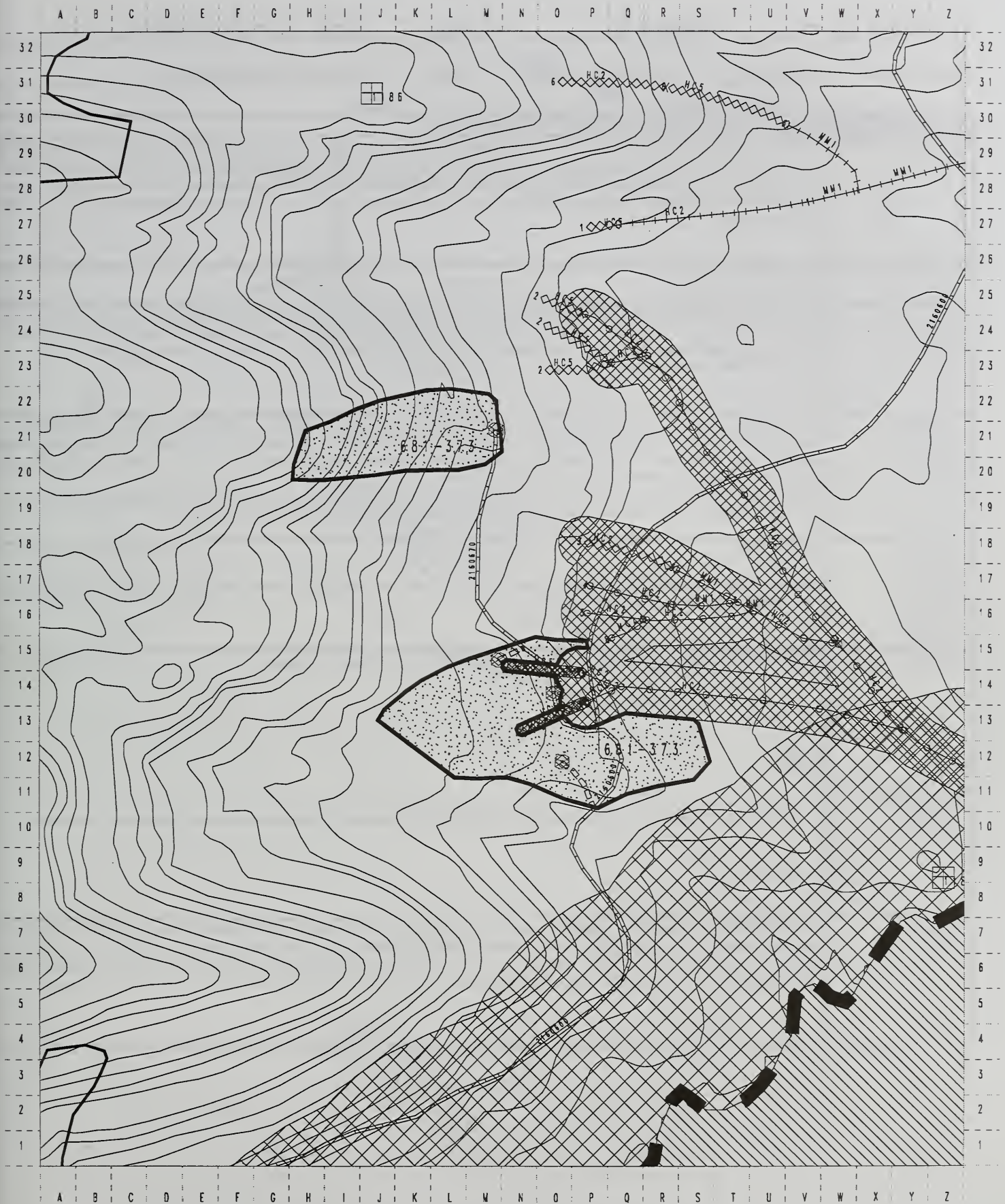
VCU-UNIT#: 681-373 (Actually 682-373) ACRES: 21 VOL: 660 MBF ALTERNATIVES: 3,4,6

PHOTO YR/#: '91-390-212 1/4 QUAD: CRG A-1 SE 1/4 LOGGING SYSTEMS: HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 68202-047, high windthrow risk, portion downhill yarded. Productivity of site is moderate. Road should be adjusted to come into northern section. Uneconomic, low volume area central portion of unit. Partial cut buffer. Anticipate planting 20 acres of Alaska yellow cedar to maintain composition. Option: helicopter yarding.   |
| J. Oien 5/96   | ROADS: No concerns.  |
| R.Johnson<br>6/96  | SOILS/WATERSHED: Soils mapped 33E (StNicholas - McGilvery 60-75%), 75D (Kupreanof - McGilvery 35-60%). Partial suspension for MMI3, forested wetland, and McGilvery (BMPs 12.5, 13.9; TLMP 1997). Probable deletion for MMI4 on north end of unit, was included in deletion by silviculture (BMP 13.5). Silviculture deleted low volume wetlands in all but areas on the SE corner and the W center parts of the unit (BMP 12.5). Protection of streams per fisheries (BMPs 12.6a, 13.16).   |
| M.Becker,<br>J.Hannon, 7/6/95<br>D.Kuntzsch, 7/96  | FISHERIES: New unit boundaries should exclude most fisheries concerns. Stream 7 branches just within the east boundary of the south unit section. Below the unit boundary stream 7 is a class II blue/white TTRA stream; this reach requires 120' no-cut buffer. Within the unit both branches of stream 7 become class III orange/white. Both branches of stream 7 require slope break buffers. The orange/ white streams, if not buffered, require directional falling, split yarding or full suspension over, and immediate removal of logging debris (BMP 12.6a, 13.16). |
| D.Parker,<br>C.Crocker-<br>Bedford,<br>N.Matson,<br>E.Campbell<br>7/6/95<br>M.Dillman<br>B.Johnston<br>6/20/96 | WILDLIFE:<br><br>Marbled murrelet eggshell fragments found in southwest corner of unit (goshawk calling station 8). Deer sign seen throughout the unit. Several patches of grass in unit. Snag patches in unit also. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 6/20/96 Found both red and Sitka alder in area as well as Pacific yew trees. Spent some time looking for more marbled murrelet eggshells. Strange gray bedrock in streams.  |
| J.Bauchtal<br><br><br><br><br><br><br><br><br><br>T.Fifield<br>10/28/96  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br><br><br><br><br><br><br><br><br>LANDS:<br><br><br><br><br><br><br><br><br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br><br><br><br><br><br><br><br><br>VISUALS:  |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Partial suspension required. Economics very poor due to long road and difficult helicopter water drop exposed.   |

# Chasina Study Area Interim Layout NOI Unit 681-373

Mapscale 1:7920 (8 inch to Mile)





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

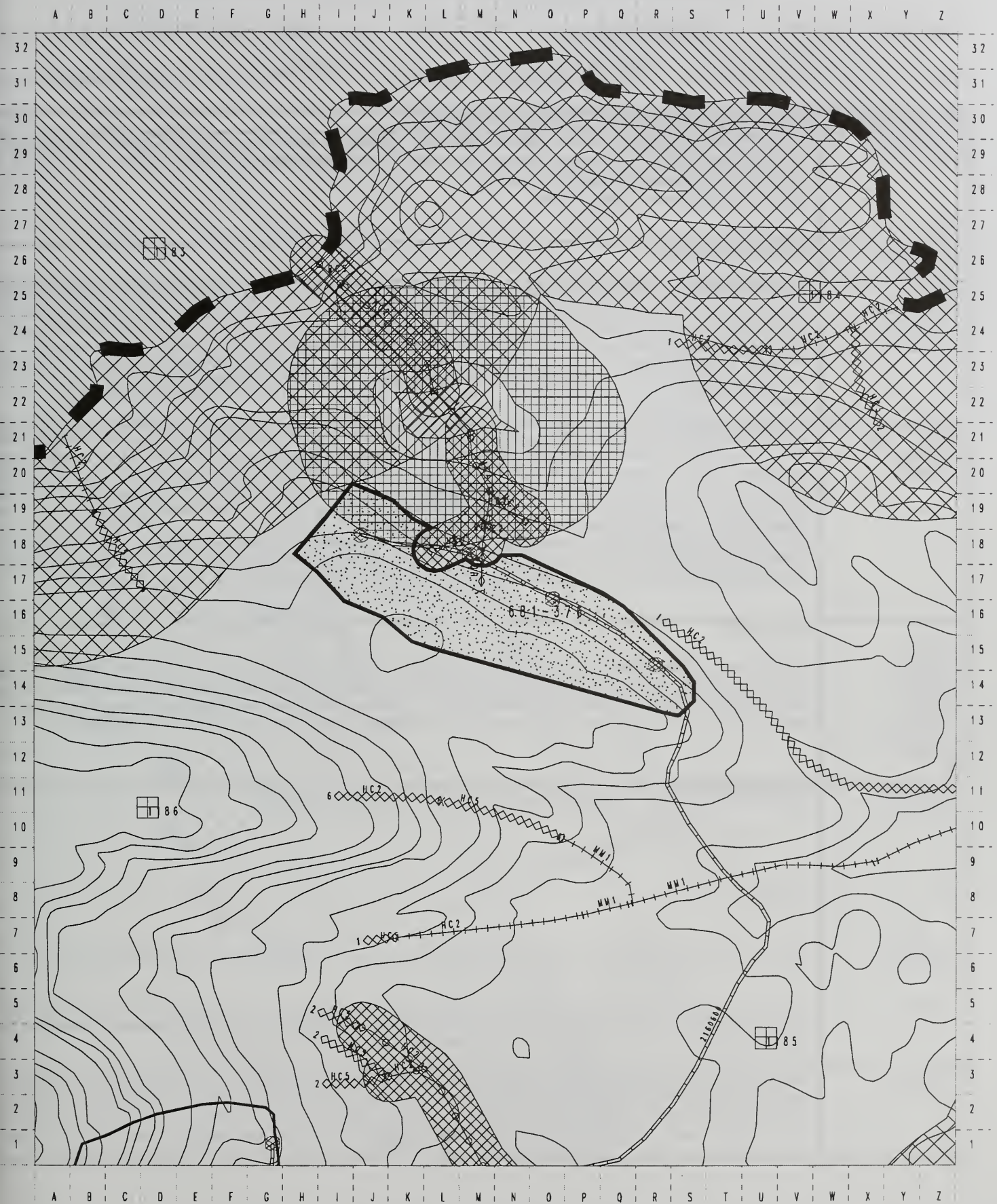
VCU-UNIT#: 681-376      ACRES: 19      VOL: 400      MBF      ALTERNATIVES: 2, 3, 4, 6

PHOTO YR/#: '91-390-213      1/4 QUAD: CRG A-1      LOGGING SYSTEMS: HE

| REVIEWER&DATE   | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|---|--|
| G.Lawton<br>12/97   | SILVICULTURE/TIMBER: 68101-7, low windthrow risk, portion downhill yarded, high mistletoe present. Unit changed to provide proportionality of volume classes. Productivity of site is low. Maintain setting width between units. Drop NW corner - low volume. Keep road out from toe slope for deflection. Narrow unit to mitigate visual concerns and YC seed dispersal. Lake buffer. Anticipate planting 10 acres of Alaska yellow cedar to maintain composition. Road may be realigned. Option: helicopter but low volume.  |
| J. Oien 5/96  | ROADS: No concerns.  |
| Field<br>D.J.Landwehr<br>9/15/95<br>EIS R.Johnson                         | SOILS/WATERSHED: Full suspension is required in the middle of the unit because of shallow McGilvery soils on convex slopes and rock outcrops (TLMP 1997). Partial suspension is required in the remainder of the unit for MMI3 (BMP 13.9). The McGilvery will be reviewed during layout to determine suitability. Protection of streams and lake per fisheries (BMPs 12.6, 12.6a, 13.16). Additional information is filed in the reconnaissance folder.  |
| J. Hannon,<br>M. Becker,<br>N. Matson,<br>7/5/95                          | FISHERIES: The Class I adfluvial lake on the northeast boundary requires a 100' no cut/ 400' partial cut buffer (BMP 12.6). Stream 2 is a Class I blue/ white that requires a 120' TTRA buffer (BMP 12.6) Stream 3 is a class I blue/ white stream that requires a 100' TTRA buffer (BMP 12.6). This stream becomes Class III green/ white part way into the unit. Under the new TLMP (1997) standards this section of stream 2 is a class IV green/ white.<br>The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris by the end of the operating season or before the yarder leaves the area (BMP 13.16). |
| M.Dillman,<br>M.Pacheco<br>6/30/95<br>M.Dillman,<br>B.Johnston<br>6/20/96 | WILDLIFE:<br><br>Moss/hemlock understory. Karst and blowdown in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density.  |
| J.Baichtal<br><br><br><br><br><br><br><br><br><br>T.Fifield<br>10/28/96   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.<br><br><br><br><br><br><br><br><br><br>LANDS:<br><br><br><br><br><br><br><br><br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br><br><br><br><br><br><br><br><br>VISUALS:  |
| G.Lawton<br>12/97   | PRESCRIPTION: <u>Clear-cut w/ reserves</u> ; retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Full suspension middle of unit; this section should be deleted from the unit based on percent of McGilvery present (TLMP 1991). Partial suspension remainder. "Unit added from the preferred alternative due to proportionality based on acres." Very poor economics.  |

# Chosina Study Area Interim Layout NOI Unit 681-376

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |



# CHASINA PROJECT HARVEST UNIT DESIGN CARD

VCU-UNIT#: 682-301      ACRES: 54      VOL: 1719      MBF      ALTERNATIVES: 3,4,6

PHOTO YR/#: '91-390-171      1/4 QUAD: CRG A-1      SE 1/4      LOGGING SYSTEMS: SL / Helicopter

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS   |
|--|---|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER:68202-064, high windthrow risk. Productivity of site is high. Visually sensitive. Uneconomic, low volume area east and south. Adjacent to old growth reserve. Estuary buffer at bottom probably coincides with steep drop-off blind-lead area which parallels shoreline at about 55'.<br>Option: helicopter yarding / strip corridors.  |
| J. Oien 5/96   | ROADS: No concerns.   |
| Field<br>D.J.Landwehr<br>9/12/95<br>EIS R.Johnson.                                 | SOILS/WATERSHED: Minimum of partial suspension for MMI3 and McGilvery (BMP 13.9; TLMP 1997). Locate west boundary on top of the nearly continuous 40' cliff. May need to delete an additional five acres of low volume timber along the northeast side of the unit. Orange and white protection of the south boundary stream, and the middle stream and v-notch (BMP 13.16). Green and white protection for one stream on each side of the middle stream (BMP 13.16). Two to three acres above the cliff/slope break and adjacent to these streams may not be suitable for harvest. May need to helicopter yard because of limitations with the road (BMPs 13.9, 14.2). Minor amounts of Kaikli soil present (TLMP 1997). Additional information is filed in the reconnaissance folder.   |
| K. McCartney,<br>K.Buckley,<br>5/28/96   | FISHERIES: Stream 3 was a Class III orange/white, under the new TLMP (1997) standards stream 3 is a class IV orange/ white that is 3 feet wide, has 6 feet of incision, and a gradient of 31%. Stream 3 is flagged orange/ white to provide additional resource protection. Stream 4 is a class IV green/ white. Stream 5 is a class IV green/ white. Stream 6 is a class IV green/ white. If stream 5 or 6 is found to be a V-notch, protection level should be raised to a Class III orange/white (see soils section). Stream 7 is a class III orange/white (soils located this stream). The class III streams should be reviewed during unit layout to determine the need for class III buffers. More streams than noted here are probable within unit.<br>The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean stream of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16). The orange/white streams require directional falling, and split yarding or full suspension. Clean streams of introduced logging debris immediately. |
| D.Parker,<br>J.Wrate,<br>M.Pacheco<br>7/18/95<br>C.Tighe,<br>B.Johnston<br>5/28/96 | WILDLIFE:<br><br>Wolves heard howling and snarling from goshawk calling station 6 (middle of the unit). Deer browse, pellets, and game trails seen throughout unit. No bear sign seen. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. 5/28/96 Unit has snags throughout area. Sapsucker holes in trees and snags. Survey was not actually in the unit but just below it. Unit exceeds the steepness criteria in the current goshawk protocol. Maintain 1000 foot estuary.  |
| J. Short 5/96<br>J.Baichtal  | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.  |
| J.Short<br>12/17/97  | VISUALS: To meet the maximum modification VQO, retain about 3 acres in each of the upper corners of this unit - in effect angling the boundaries at these corners. About 1/3 the distance from the north corner (where the backline makes a pronounced jog). retain about (5-6) .5 to 1.5 acre islands radomly scattered along the middle section of the backline.  |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Feather backline with retention islands along top boundary as suggested by visuals section. Minimum partial suspension. West boundary top of cliff. Delete 5 acres low volume northeast. Drop minor amount on bottom due to beach buffer. Monitor for PCT at 20 years.  |



# Chasino Study Area Interim Layout N01 Unit 682-301

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD

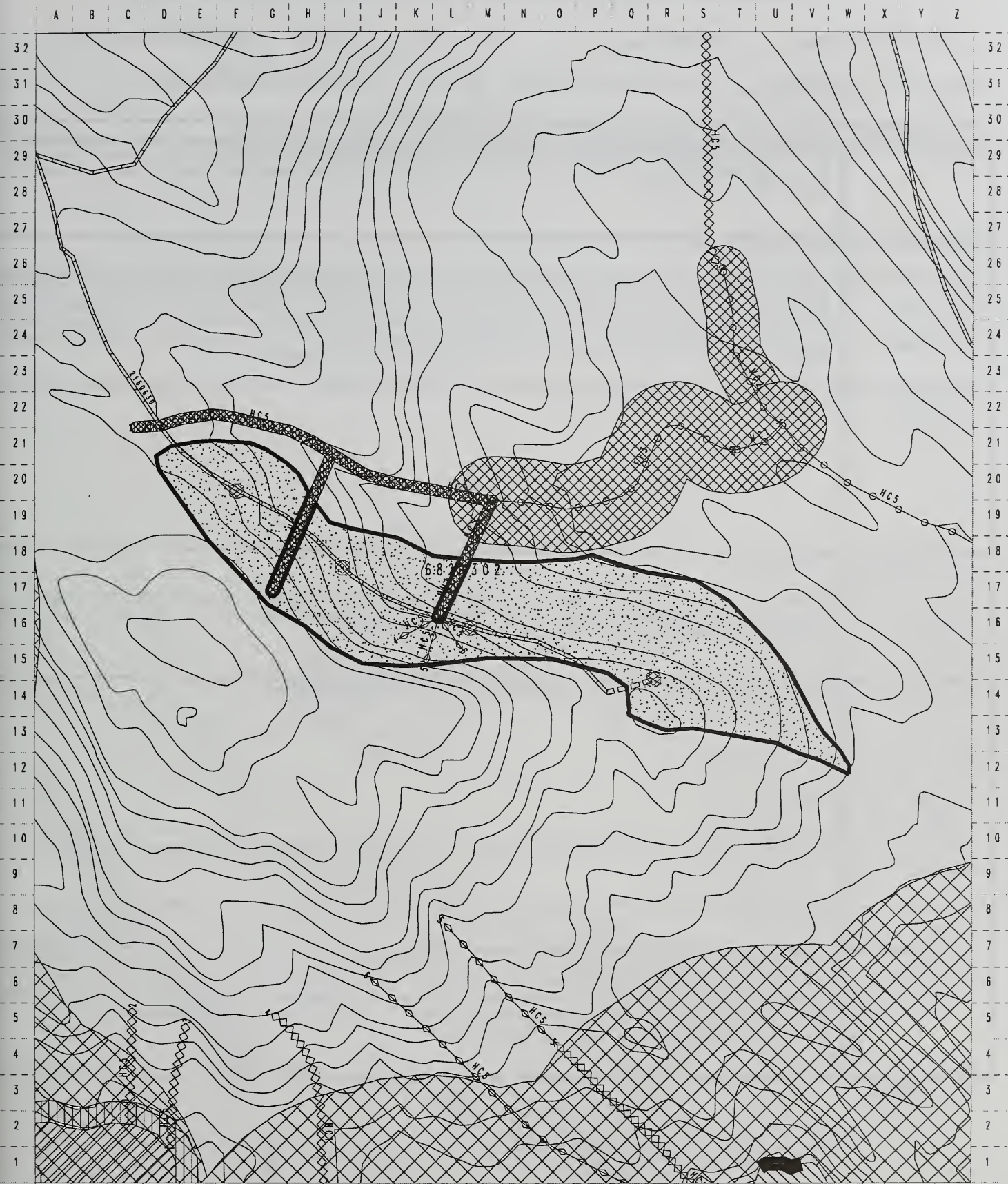
VCU-UNIT#: 682-302      ACRES: 36      VOL: 1015      MBF      ALTERNATIVES: 3, 4, 6

PHOTO YR/#: '91-390-172      1/4 QUAD: CRG A-1 SE 1/4      LOGGING SYSTEMS: RS /HE

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 68202-012, high windthrow risk, portion downhill yarded, high mistletoe present. Productivity of site is high / moderate. Uneconomic, low volume area surrounding. Maintain setting width between units. Steep slopes may limit yarding. Helicopter yarding method above cable reach of lower unit, adjust bdry accordingly. Due to resource protection (682-307). Option: running skyline.   |
| J. Oien 5/96   | ROADS: No concerns.  |
| D.J.Landwehr<br>9/13/95<br>R.Johnson<br>5/30/96  | SOILS/WATERSHED: Elevation on the east end of the unit should be 300' rather than the 200' shown on the unit card. Upper backline is about 500'. Elevations were measured in the field and may not correspond to those shown on the unit map. Minimum of partial suspension for most of the unit for MMI3 and McGilvery soils (BMP 13.9; TLMP 1997). Full suspension is required on small areas of slopes over 75% (BMP 13.5). May need to delete three acres of low volume timber west of the green and white stream in the west end of the unit. Orange and white protection on the north boundary stream (upper portion of fisheries #2 which is in a V-notch), and a short tributary to this stream that lies in the unit (lower end of fisheries #5) (BMP 13.16). Green and white protection on the upper end of fisheries stream #5. Limitations with proposed road and need for additional roading favor converting unit to helicopter yarding (BMP 14.2). Additional information is filed in the reconnaissance folder.              |
| K. McCartney,<br>K. Buckley,<br>C. Tighe,<br>B. Johnston,<br>5/30/96                           | FISHERIES: Stream 1 is a class I blue/ white TTRA that requires a 200' buffer; this stream is outside the unit. Stream 2 is a class I blue/ white that requires a 200' TTRA buffer (BMP 12.6). Above the confluence with stream 5, stream 2 becomes a class III orange/ white. The southern slope break of stream 2 should be the northern unit boundary. Stream 3 is a class III orange/ white that is 10 feet wide, has 16 feet of incision and 18% gradient. Stream 3 requires a slope break buffer (BMP 13.16). Stream 5 is a class III orange/ white that is 7 feet wide, has 13 feet of incision, and 4% gradient. This section of stream 5 requires a slope break buffer (BMP 13.16). Above 380' of elevation stream 5 becomes a class IV green/ white. Stream 6 is a class IV green/ white. The green/ white streams require directional falling, and split yarding (where practical) or partial suspension. Clean streams of introduced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16). |
| D.Parker, J.Wrate<br>7/19/95<br>C.Tighe,<br>B.Johnston<br>K.Buckley,<br>K.McCartney<br>5/30/96 | WILDLIFE:<br><br>Deer sign throughout unit. No understory vegetation. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. Good wildlife snags in unit.   |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type C clear-cut. Minimum of partial suspension. Full suspension required for slopes over 75% below cliff middle of unit. Deleted 3 acres low volume west of G & W stream west end of unit. Deleted steep cliffs along backline. Too isolated for PCT.   |

# Chosina Study Area Interim Layout NOI Unit 682-302

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | No Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

VCU-UNIT#: 682-304      ACRES: 26      VOL: 650      MBF      ALTERNATIVES: 4,6

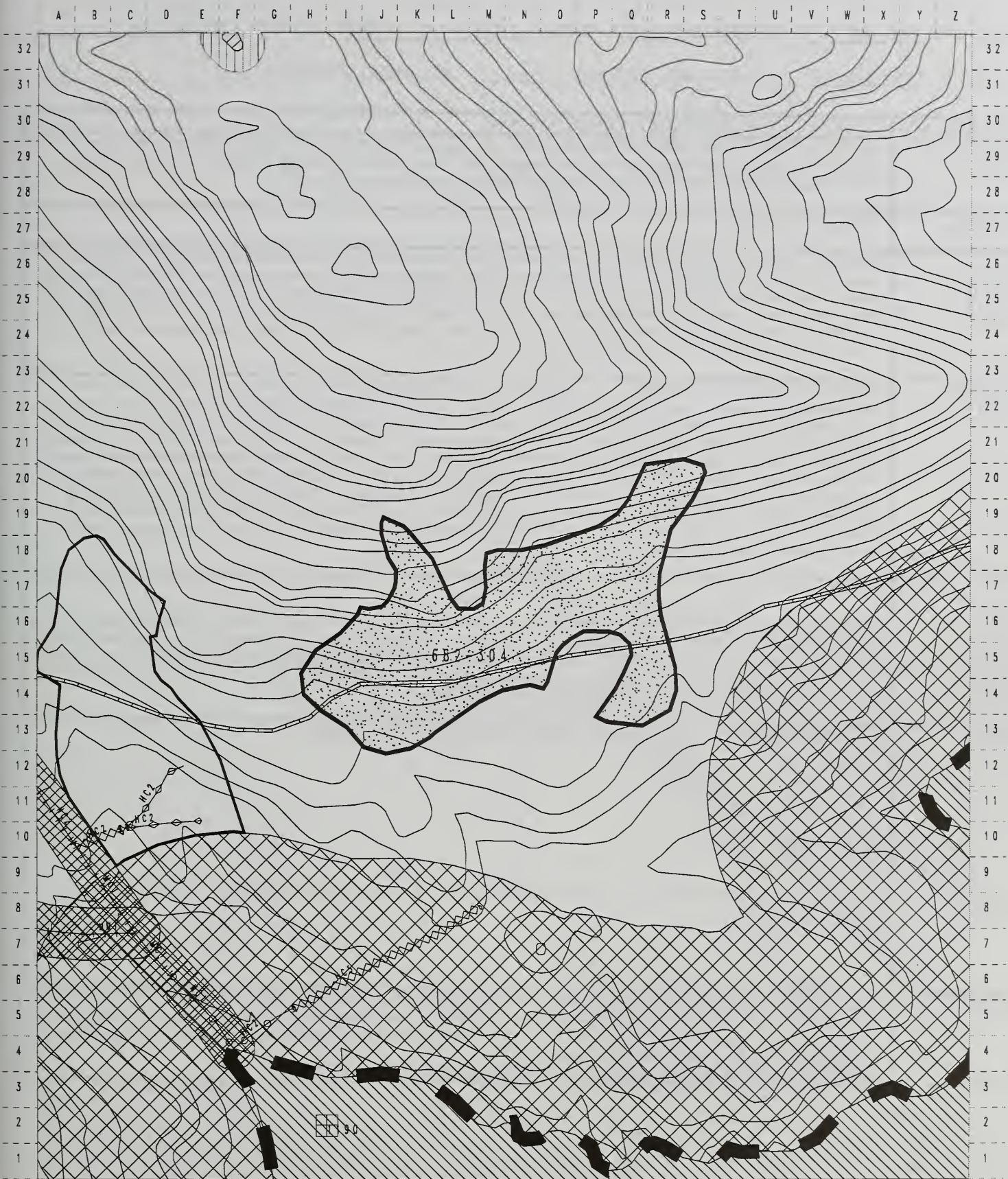
PHOTO YR/#: '91-390-212      1/4 QUAD: CRG A-1 SE 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 68202-033, low windthrow risk. Productivity of site is moderate. Uneconomic, low volume area surrounding. Maintain setting width between units. Anticipate planting 5 acres of Alaska yellow cedar to maintain composition. Option: helicopter yarding.   |
| J. Oien 5/96   | ROADS: No concerns.  |
| Field<br>D.J.Landwehr<br>8/30/95<br>EIS R.Johnson                      | SOILS/WATERSHED: Full suspension near and upslope of an existing landslide in the northeast portion of the unit for MMI3 and MMI4 soils, slopes over 75%, and thin McGilvery (BMPs 13.5, 13.9; TLMP 1997). Partial suspension in the remainder of the unit for MMI3 and forested wetlands (BMPs 12.5, 13.9). Upper backline should be at the base of the large cliff. Limitations with the yarding access from the road favors conversion to helicopter yarding (BMPs 13.9, 14.2). Defer harvest on Kaikli (TLMP 1997). Additional information that was removed from this unit card is filed in the reconnaissance folder. |
| K. McCartney,<br>B. Johnston,<br>5/30/96                               | FISHERIES: No stream concerns in the unit.   |
| D.Parker, J.Wrate<br>7/20/95<br>B. Johnston,<br>K.McCartney<br>5/30/96 | WILDLIFE:<br><br>Deer browse seen in unit. Bear scat seen in unit. Recommend leaving live reserve trees and snags where possible to maintain habitat structure and snag density. If the current definition of an estuary is maintained then the class I stream to the south of this unit will require a 1000 foot buffer. This may effect the acreage of this unit.  |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, mineral, karst or cave resource concerns.  |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The unit lies in a low sensitivity zone for cultural resources. There are no concerns with the unit, as planned.   |
| J.Short 5/96   | VISUALS: Retain at least 50% of the stand in the NW lobe of the unit to blend the backline to the shape of the landform.   |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 5% of cutting unit, where feasible and safe. Areas should be in clumps or patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type A clear-cut. Full suspension required in the northeast section of the unit, slopes over 75%, and on the talus slope area. Partial suspension remainder of unit place backline at base of large cliff. Recommend converting to helicopter yarding for the protection of watershed resources.<br><u>Drop out of preferred because of exposed helicopter drop zone.</u>                |



# Chasino Study Area Interim Layout NOI Unit 682-304

Mapscale 1:7920 (8 inch to Mile)



- |  |                       |  |                            |  |                                      |  |                    |
|--|-----------------------|--|----------------------------|--|--------------------------------------|--|--------------------|
|  | Class 1 Stream        |  | Saltwater                  |  | No Cut Stream Buffers                |  | Proposed Landings  |
|  | Class 2 Stream        |  | Fresh Water Lake           |  | Variable Width No Cut Stream Buffers |  | Existing Temp Road |
|  | Class 3 Stream        |  | 1000' No Cut Beach Buffers |  | Variable Width No Cut Karst Buffers  |  | Proposed Temp Road |
|  | Class 4 Stream        |  | Na Cut Lake Buffers        |  | Alternative To Clearcutting Units    |  |                    |
|  | Existing Roads        |  | Partial Cut Lake Buffers   |  |                                      |  |                    |
|  | Proposed Roads        |  |                            |  |                                      |  |                    |
|  | Unit Boundary         |  |                            |  |                                      |  |                    |
|  | Susp/Yarding Boundary |  |                            |  |                                      |  |                    |





# CHASINA PROJECT HARVEST UNIT DESIGN CARD DRAFT

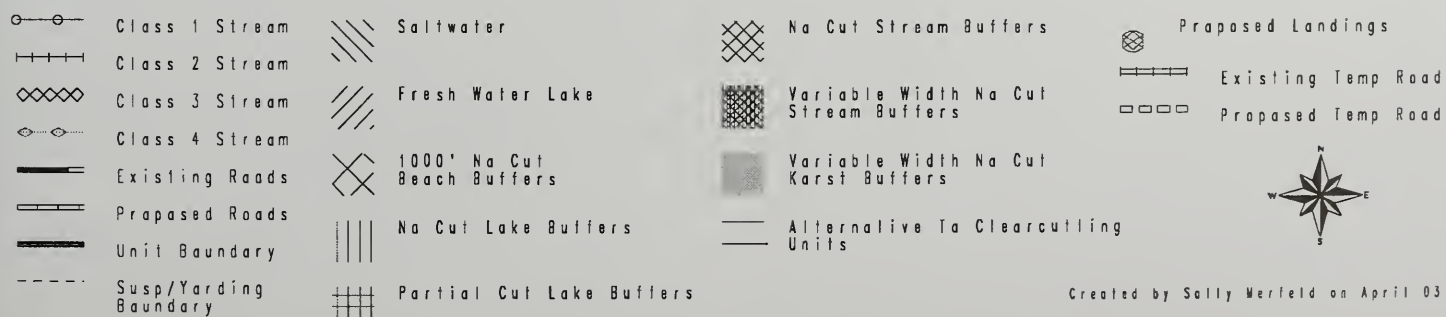
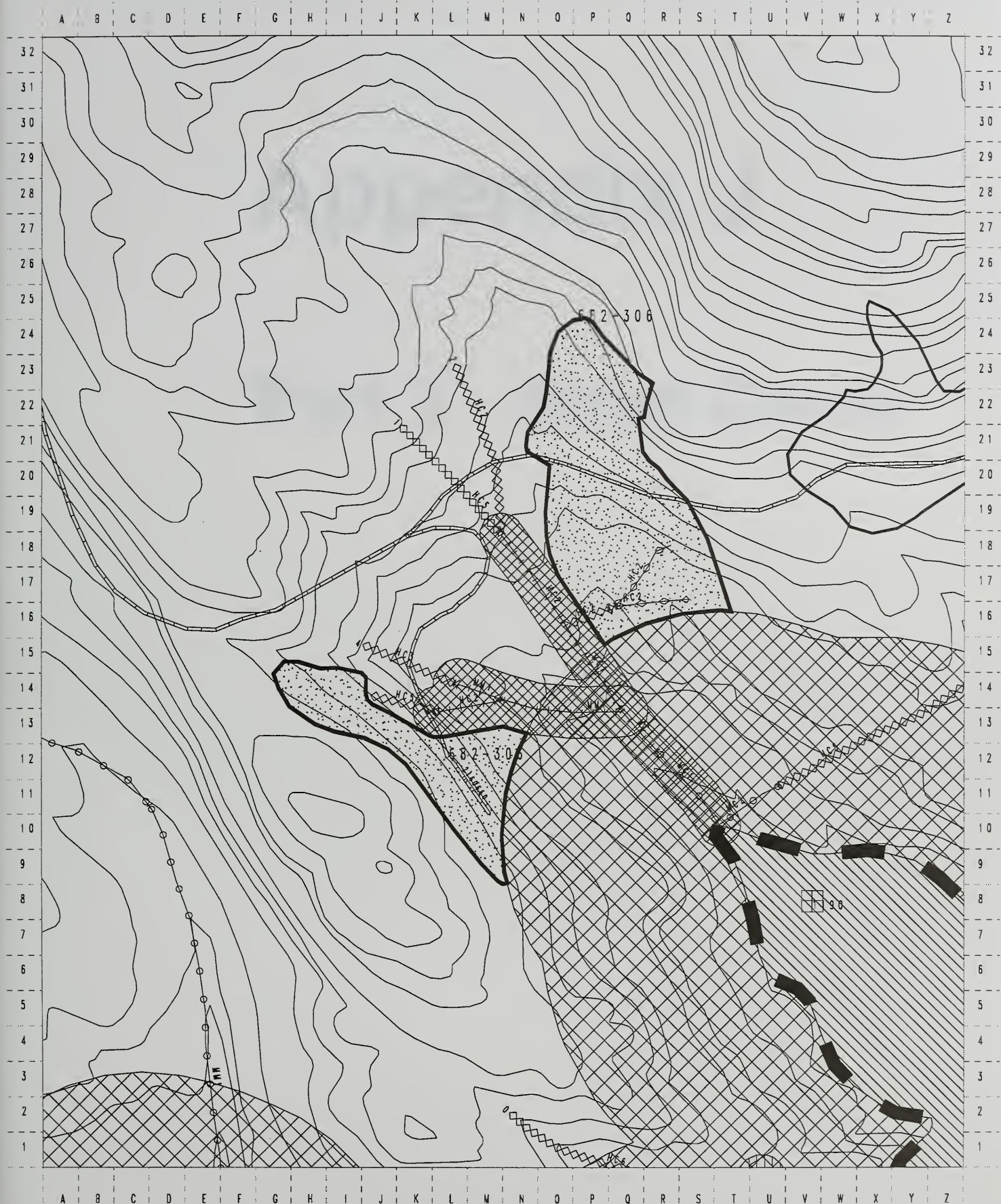
VCU-UNIT#: 682-306      ACRES: 26      VOL: 414      MBF ALTERNATIVES: 4,6

PHOTO YR #: '91-390-171      1/4 QUAD: CRG A-1 SE 1/4      LOGGING SYSTEMS: RS

| REVIEWER&DATE  | RESOURCE CONSIDERATIONS/RECOMMENDATIONS  |
|--|--|
| G.Lawton<br>12/97  | SILVICULTURE/TIMBER: 68202-031. High windthrow risk. portion downhill yarded. Productivity of site is low. Uneco-<br>nomic, low volume area surrounding and in center portion. More value available if road comes from above. Stay out of estuary<br>buffer. Partial cut buffer. Option: helicopter yarding. Dropped 13 acres due to estuary buffer.   |
| J. Oien 5/96   | ROADS: No concerns.  |
| Field<br>D.J.Landwehr<br>9/19/95<br>EIS R.Johnson                  | SOILS/WATERSHED: Minimum of partial suspension for MMI3, forested wetlands, and nonstreams (BMPs 12.5, 13.9). Pre-<br>scription by fisheries for streams, plus two additional streams for orange and white protection, one additional stream for green and<br>white protection, and two nonstreams (BMPs 12.6, 12.6a, 13.16). Differences from fisheries will have to be resolved during lay-<br>out. There may be a potential to add about four acres in the northeast corner. Limitations with yarding access from the road favor<br>conversion to helicopter yarding (BMPs 13.9, 14.2). Defer harvest on Kaikli (TLMP 1997). Additional information that was re-<br>moved from this unit card is filed in the reconnaissance folder.  |
| J. Hannon<br>7/10/95   | FISHERIES: Stream 1 is a class I blue/ white that requires a 100' TTRA buffer (BMP 12.6). Near the confluence of streams 1<br>and 4, stream 1 becomes a class II blue/white. Stream 1 changes into a class III orange/ white above 340' of elevation. Stream 1<br>will require timing for the road crossing (BMP 14.14). Stream 2 is a class III orange/ white. Stream 3 is a class III green/ white;<br>headwaters are class IV green/white. Stream 4 is a class II orange/ white that requires a 120' AHMU buffer (BMP 12.6). Stream<br>4a is a class II orange/ white that requires a 120' AHMU buffer (BMP 12.6). Stream 6 is a class I blue/white near its confluence<br>with stream 1; in the upper part of the stream it becomes a class III orange/white. The class III orange/ white streams require direc-<br>tional falling, and split yarding or full suspension. Clean stream of introduced debris immediately (BMP 13.16). The class III<br>green/ white stream require directional falling, and split yarding (where practical) or partial suspension. Clean stream of intro-<br>duced debris by the end of the operating period or before the yarder leaves the area (BMP 13.16). Stream discrepancies between<br>soils and fish will be resolved during layout. |
| M.Dillman,<br>J.Wrate 7/10/95<br>C.Tighe,<br>B.Johnston<br>5/30/96 | WILDLIFE:<br><br>Blowdown and second growth present. Recommend leaving live reserve trees and snags where possible to maintain habitat struc-<br>ture and snag density. 5/30/96 Deer sign and pellets seen in unit. Unit also has game trails throughout. Karst was found along<br>the eastern portion of the unit. The southern portions of both parts of this unit may have to be dropped depending on the final defi-<br>nition of an estuary and its required buffer. As the unit is now mapped in GIS the southern portions are both in estuary buffers<br>and will need to be dropped. Pacific Yew trees were found in the unit.   |
| J.Baichtal   | GEOLOGY/MINERALS: No known geology, minerals, karst or cave resource concerns.   |
| T.Fifield<br>10/28/96  | LANDS:<br><br>CULTURAL: The lower portions of this unit were surveyed in 1996. No cultural resources were noted. There are no concerns<br>with this unit as planned.<br><br>VISUALS:   |
| G.Lawton<br>12/97  | PRESCRIPTION: <u>Clear-cut w/ reserves</u> : retain 10 - 20% of cutting unit, where feasible and safe. Areas should be in clumps or<br>patches, buffers or blind-leads, dispersed, and should contain large live trees and hard snags. Use type D clear-cut. Minimum<br>partial suspension. Conversion to helicopter yarding would eliminate the impacts of roading this unit. "Unit added from the pre-<br>ferred alternative due to proportionality based on acres."<br>DROPPED OUT OF PREFERRED BECAUSE OF EXPOSED HELICOPTER DROP ZONES.   |

# Chasina Study Area Interim Layout NO1 Unit 682-306

Mapscale 1:7920 (8 inch to Mile)



Created by Sally Werfeld on April 03, 1998





# **Appendix J**

## **Part 2 - Road Cards**



# Appendix J

Part 2 - Road Closures

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11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160795** M.P. **0.00** to M.P. **2.25**  
Sale/Offering Area ROD Road #(s)  
RE Construction (New or RE) Planned Length **2.25** Actual Length  
Unit(s) accessed **679-447,450,446** Road Locator: **Oien**

**Road Management Objectives:**

Func Class **L** Traffic Service Level **D** Hgw. Safety Act No Design Veh: **LT**

Critical Veh: **LB** Maint Level: Active Sale **2** Post Sale **1**

Intended Purpose and Use: **silvicultural purposes**

Management Strategy: Encourage Accept Discourage Eliminate Prohibit **X**

This road system is not connected to any public or community road system

Closure Devices: **Barrier, Bridge removal**

Erosion Control: **water bar**

AFRPR Closure Status: Active during sale activities. Inactive from m.p. 0.00 to 1.50 for post sale activities. M.p. 1.50 to m.p. 2.25, closed for post sale activities by pulling bridge.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** Moderate chance of individual salvage potential in the future.

**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** 3 CLASS I streams are crossed, two of these have existing culverts providing fish passage, one will require a bridge where the crossing has been removed (m.p. 1.50). Timing window to be determined after final road reconstruction package is complete and before implementation begins. Repair to existing culverts will be completed per road condition survey completed by biologists during 1997 field season, survey is located in appendix J of FEIS

**RECON/PLANNED STREAM CROSSINGS:** 3 CLASS I 0 CLASS II 0 CLASS III 0 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED:** Reconstruction will not increase the footprint of the road, no wetlands concerns.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED:** Road location is not within 1/2 mile of any known bald eagle nest sites.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

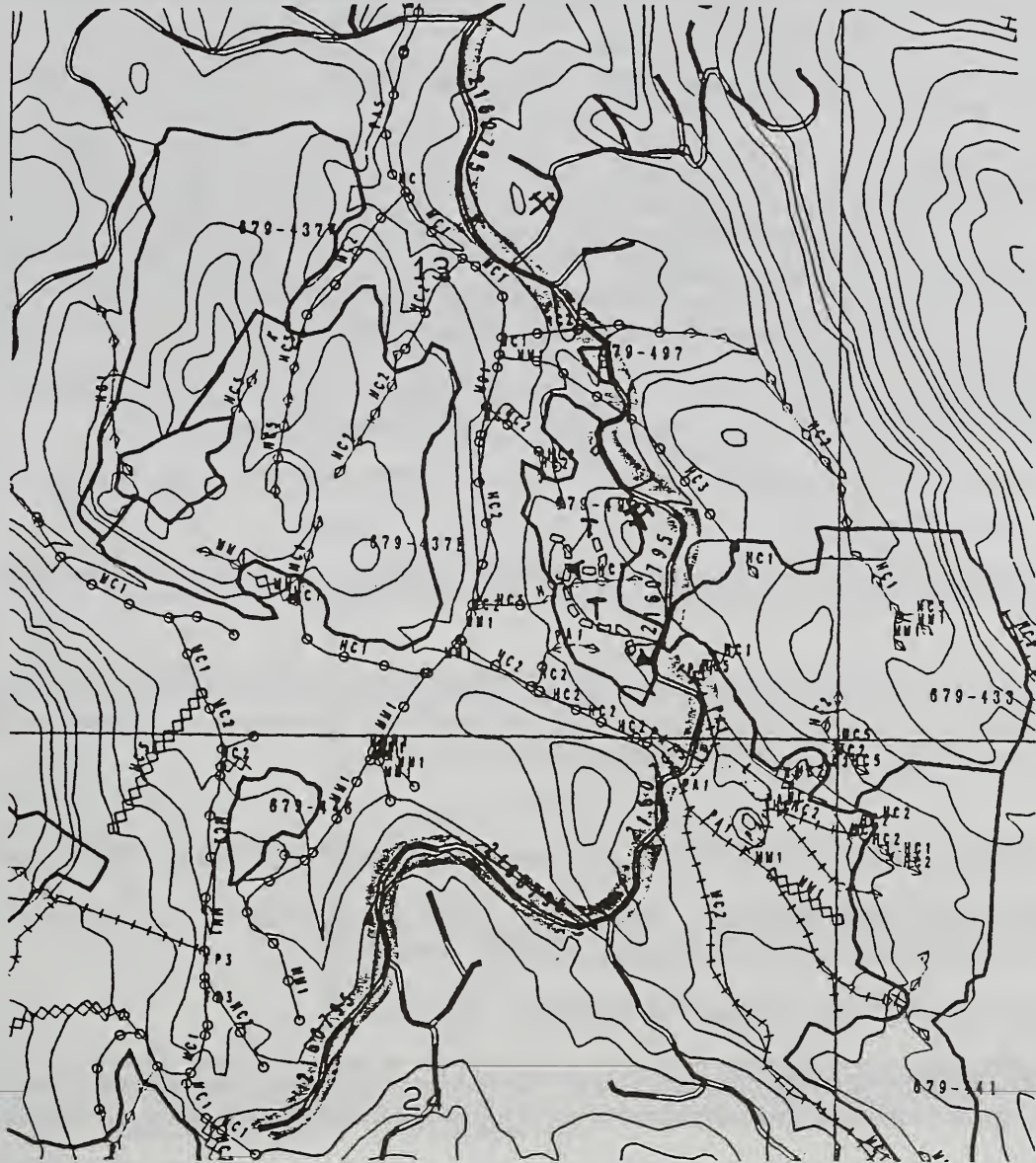
**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** No Concerns

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI activities in 20-25 years. No planting planned, ATC access 1 mile from bridge

**AS LOCATED:**



$$\begin{array}{c} \wedge \\ \nearrow \searrow \\ | \\ \vdots \\ N \end{array}$$


- |  |                   |  |                |
|--|-------------------|--|----------------|
|  | Rock Quarry       |  | Existing Roads |
|  | CLASS I Streams   |  | Construction   |
|  | CLASS II Streams  |  | Reconstruction |
|  | CLASS III Streams |  | Harvest unit   |
|  | CLASS IV Streams  |  |                |
|  | Temporary roads   |  |                |

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)  
Reconstruction should be minor with exception of culvert replacement with a modular bridge m.p. 1.50 (CLASS I stream) and the repair of any culverts identified in the road condition survey. Upon completion of silvicultural activities for this sale the modular bridge is to be removed, thus closing the road. Roads behind the road closure will be closed in accordance with State of AK closure regulations.

**Planned/Implemented:** (describe changes and rationale):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map may be in limestone areas.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160986** MP. **0.00** to M.P. **0.35**  
Sale/Offering Area **ROD Road #(s)**  
**NEW** Construction (New or RE) **Planned Length 0.35** **Actual Length**  
Unit(s) accessed **678-312** Road Locator: **Oien**

**Road Management Objectives:**

Funcnt Class **L** Traffic Service Level **D** Hgw. Safety Act No **Design Veh: LT**  
Critical Veh: **LB** Maint Level: **Active Sale 2** **Post Sale 1**

Intended Purpose and Use: **silvicultural purposes**

Management Strategy: **Encourage** **Accept** **Discourage X** **Eliminate** **Prohibit**

**This road system is not connected to any public road system.**

Closure Devices: **Barrier,**

Erosion Control: **water bar**

**AFRPR Closure Status:** **Active during sale activities. Closed status after initial entry.**

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED: No Concerns**  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Class III streams may require timing depending on final road location, proximity to fish habitat, bank stability and transport capabilities. Timing and passage requirements will be determined by district biologist after final road location is complete.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 0 CLASS II 1 CLASS III 0 CLASS IV

**AS LOCATED STREAM CROSSINGS:**    CLASS I    CLASS II    CLASS III    CLASS IV  
**CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING**

**AS LOCATED CATALOGED STREAM CROSSINGS: NONE**

**SOILS/WATER/WETLANDS RECON/PLANNED:** Road location will avoid wetlands whenever possible. Road location on wetlands to be kept to a minimum and only where no other practical alternative is available. No endhaul material to be placed on wetland areas.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's; 14.2-14.3, 14.5-14.14

**WILDLIFE RECON/PLANNED:** Planned road location is within 1/2 mile of known bald eagle nesting site. Follow interagency agreement with USFWS.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED: No Concerns**

**AS LOCATED:**

**CULTURAL RECON/PLANNED: No Concerns**

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** Karst development within unit, road construction should minimize clearing limits and disturbance during construction. road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be reviewed by both Forest Geologist and District Fisheries staff. .

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI activities in 20-25 yrs. Less than 1 mile accessibility, no planting anticipated..

**AS LOCATED:**

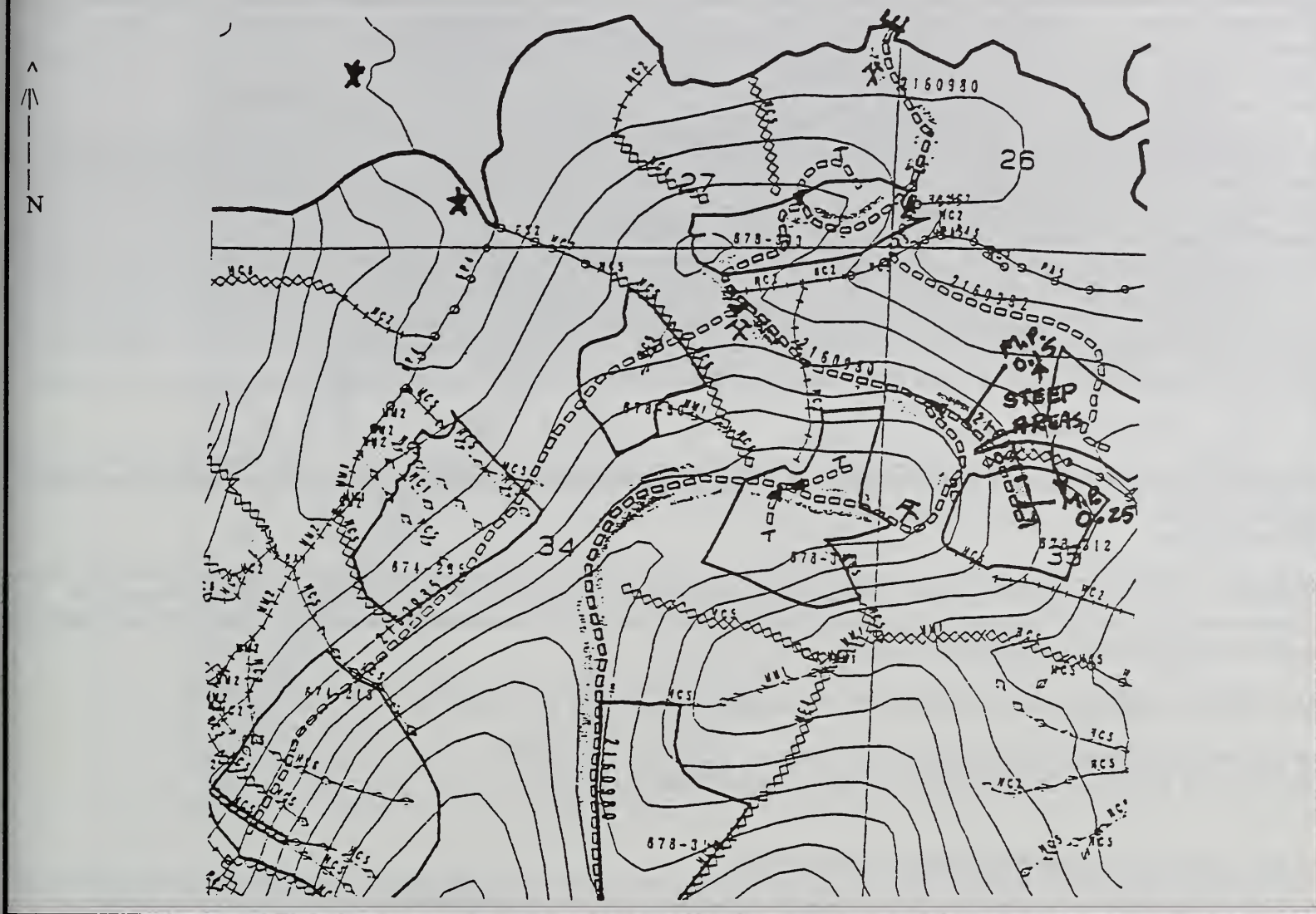


Road #2160986 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 590-65



- X Rock Quarry
- 0-0-0- Class I Stream
- 1-1-1- Class II Stream
- ◇◇◇◇ Class III Streams
- ◇◇◇◇ CLASS IV Streams
- T Temporary road
- \* Eagle Nest Site

- Existing Roads
- Construction
- Reconstruction
- Harvest unit

**Recon/Location Narrative/Design Considerations: (Major drainages, road grades, future access, etc.)**

Road flagged in white and portions in blue polkadot flagging. There are Karst concerns in the area but these can be avoided in final location by working with logging systems and karst resource personnel(See Baichtal report). One Class III stream crossed. Road grades are adverse with pitches to 15%, location should roll to take advantage of topog breaks in order keep construction effects to a minimum. Road construction should be moderate to easy depending on final road location to accomodate logging systems.Side slope gradients exceed 67% in some areas m.p. 0.15 to m.p.0.25, BMP 14.7 applies. Full bench and endhaul where appropriate to protect resources. .

**Planned/Implemented: (describe changes and rational):**

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map may be in limestone areas.



1/10/96

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name Chasina Road No. 2160985 M.P. 0.00 to M.P. 1.50  
Sale/Offering Area ROD Road #(s)  
NEW Construction (New or RE) Planned Length 1.5 Actual Length  
Unit(s) accessed 674-213,265,678-301 Road Locator: Oien

**Road Management Objectives:**

Funct Class L Traffic Service Level D Hgw. Safety Act No. Design Veh: LT

Critical Veh: LB Maint Level: Active Sale 2 Post Sale 1

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage Eliminate X Prohibit

This road system is not connected to any public or community road system

Closure Devices: Barrier,

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities Closed status after initial entry, m.p. 0.3 to end.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** Moderate opportunity for salvage & future settings on first .25 miles of road.

**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Timing on class III streams may be required depending on final road location, proximity to fish habitat, bank stability and transport capabilities. Timing requirements will be determined after final road location is complete.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 0 CLASS II 2 CLASS III 5 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER/WETLANDS RECON/PLANNED:** Road location will avoid wetlands whenever possible. Road location on wetlands to be kept to a minimum and only where no other practical alternative is available. No endhaul material to be placed on wetland areas.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22.

**WILDLIFE RECON/PLANNED:** Road location may be within 1/2 mile of known bald eagle nest sites. Follow interagency agreement with USFWS.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

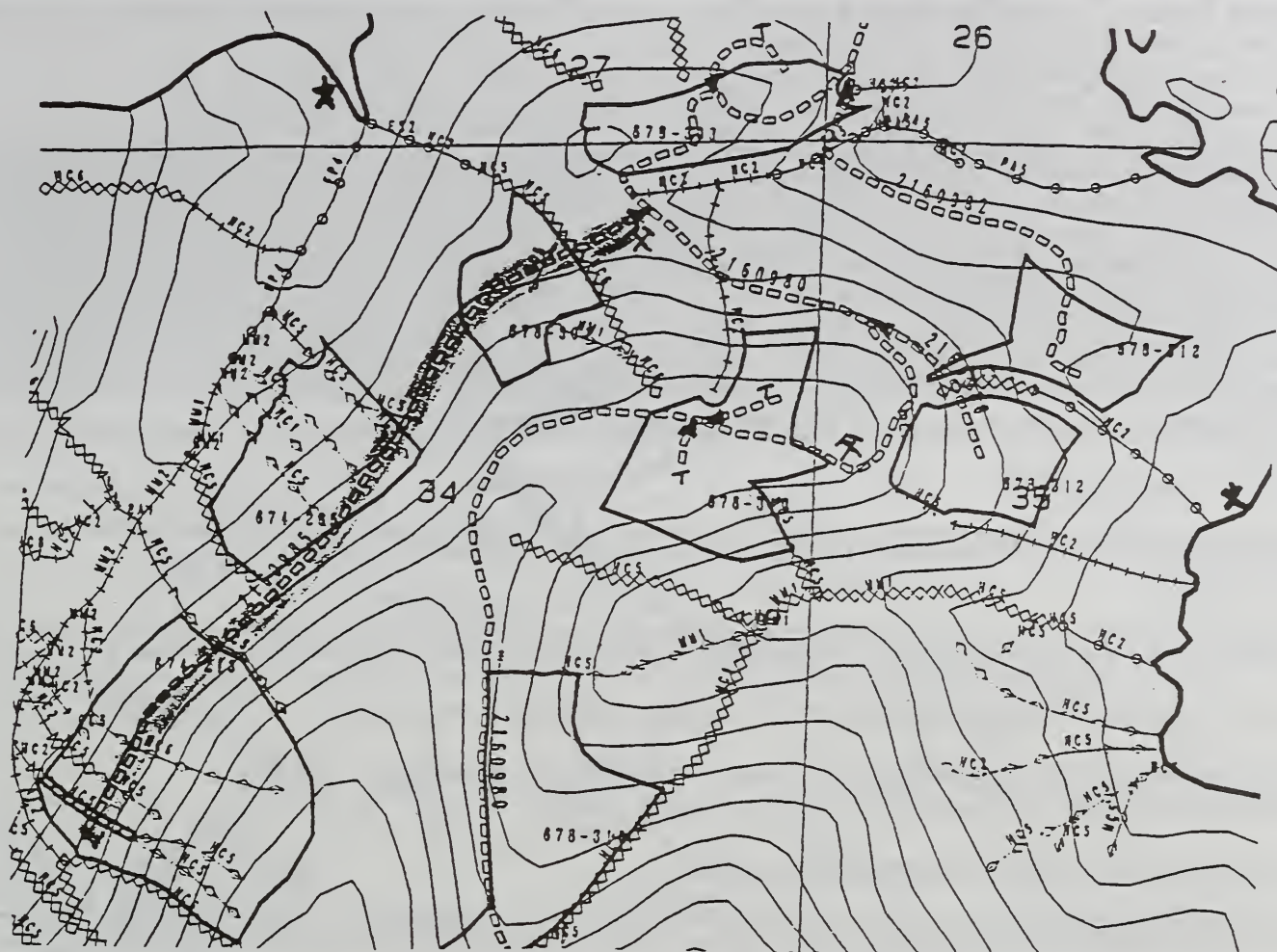
**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** Karst development within unit, road construction should minimize clearing limits and disturbance during construction. road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be reviewed by both Forest Geologist and District Fisheries staff..

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI activities in 15-25 years. Less than 1 mile access, no anticipated planting.

**AS LOCATED:**





- X Rock Quarry
- 0-0-0- CLASS I Streams
- I-I-I- CLASS II Streams
- ◇◇◇◇ CLASS III Streams
- ◇◇◇◇ CLASS IV Streams
- T Temporary road
- \* Eagle Nest Site

- Existing Roads
- Construction
- Reconstruction
- Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Road flagged in white and portions in blue polka dot flagging. There are Karst concerns in the area but these can be avoided in final location by working with logging system and karst resource personnel(See Baichtal report). No CLASS I streams crossed, No Class II streams crossed. Class III and IV streams may require cmps up to 900mm diameter, oversizing these cmps may be adviseable depending on whether culverts will be in for more than one season. All drainage structures to be removed after silvicultural activities are complete. Road grades should roll to take advantage of breaks in topog. Construction difficulty is moderate to easy as long as road stays on the lower slopes.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map may be in limestone areas.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160915** M.P. **0.00** to M.P. **0.60**  
Sale/Offering Area **ROD Road #(s)**  
**NEW** Construction (New or RE) **Planned Length 0.60** **Actual Length**  
Unit(s) accessed **679-409** Road Locator: **Oien**

**Road Management Objectives:**

Funct Class **L** Traffic Service Level **D** Hgw. Safety Act No **Design Veh: LT**  
Critical Veh: **LB** Maint Level: **Active Sale 2** Post Sale **1**

Intended Purpose and Use: **silvicultural purposes**

Management Strategy: **Encourage** **Accept** **Discourage** **Eliminate** **Prohibit X**  
This road system is not connected to any public road system.

Closure Devices: **Barrier**

Erosion Control: **water bar**

AFRPR Closure status: **Active during sale activities. Closed status after initial entry.**

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED: No Concerns**  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED: No concerns**

**RECON/PLANNED STREAM CROSSINGS: 0 CLASS I 0 CLASS II 0 CLASS III 0 CLASS IV**

**AS LOCATED STREAM CROSSINGS: CLASS I CLASS II CLASS III CLASS IV**  
**CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING**

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED: No areas of wetland identified on this road location.**

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED: Coordinate final road locations to avoid sensitive plant species where feasible. Platanthera Chorisiana were found in the vicinity of units 407 & 414.**

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED: No Concerns**

**AS LOCATED:**

**CULTURAL RECON/PLANNED: No Concerns**

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED: Karst development within unit, road construction should minimize clearing limits and disturbance during construction. road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be reviewed by both Forest Geologist and District Fisheries staff..**

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED: Foot access sufficient for future TSI and planting.**

**AS LOCATED:**

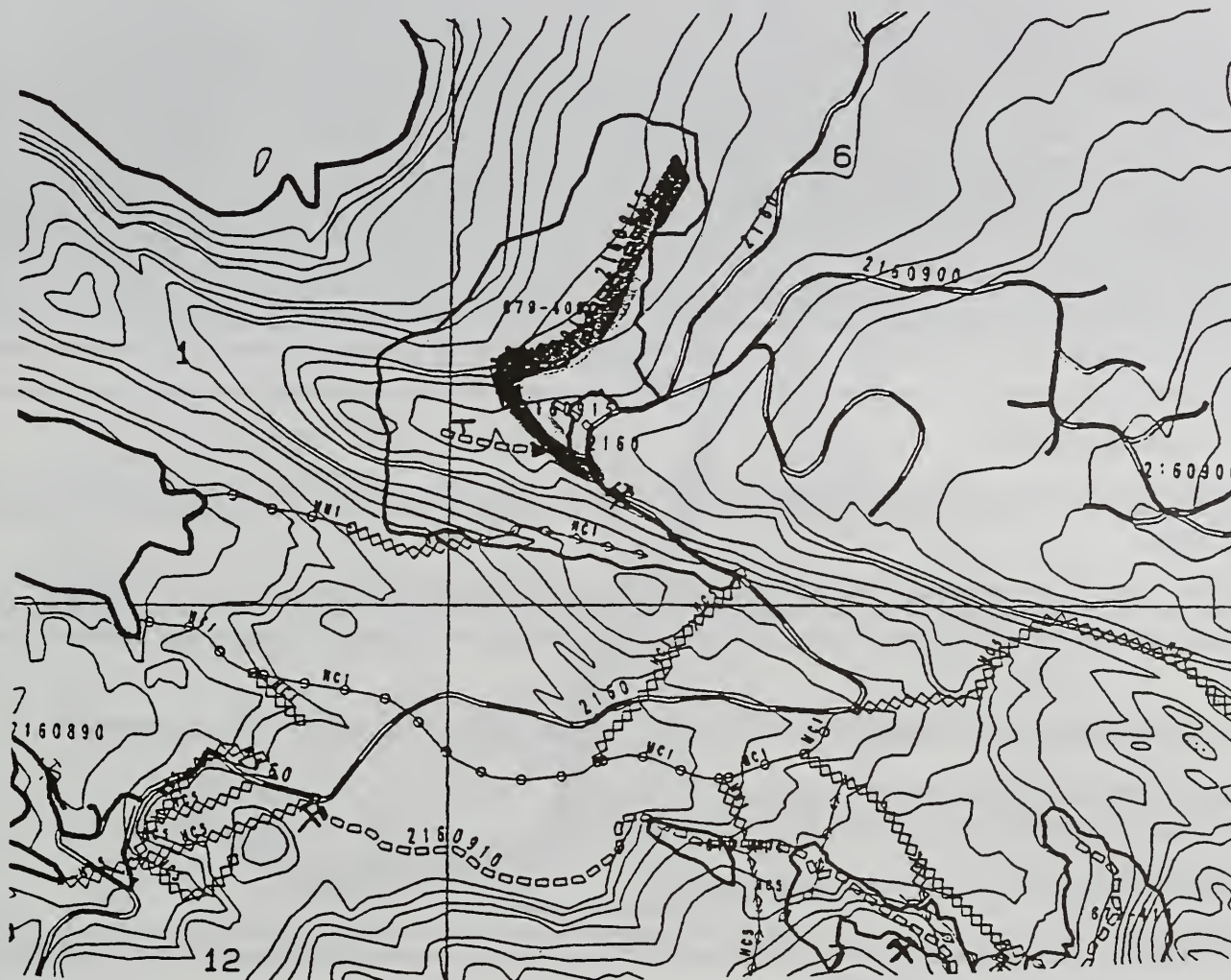



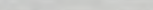


Photo # 1472-43

Photo # 1472-43

Photo # 1472-43

Photo # 1472-43



|   |                |
|---|----------------|
|  | Existing Roads |
|  | Construction   |
|  | Reconstruction |
|  | Harvest unit   |

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map .



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name Chasina Road No. 2160920 M.P. 0.00 to M.P. 2.0

Sale/Offering Area ROD Road #(s)

NEW Construction (New or RE) Planned Length 2.0 Actual Length

Unit(s) accessed 679-403,392,386,384,383,680-317 Road Locator: Oien

Road Management Objectives:

Func't Class L Traffic Service Level D Hgw. Safety Act No Design Veh: LT

Critical Veh: LT Maint Level: Active Sale 2 Post Sale 1

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage Eliminate X Prohibit

This road system is not connected to any public road system.

Closure Devices: Barrier,

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Closed status after initial entry and completion of other silvicultural activities.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** Low salvage potential along this road system.  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Some Class III streams may require timing depending on final road locations. Timing and passage to be determined by District Biologist after final road location is complete.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 0 CLASS II 2 CLASS III 4 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED:** Forested wetlands are unavoidable along this location. Minimize road width and maintain natural drainage to extent possible.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED:** No Concerns

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

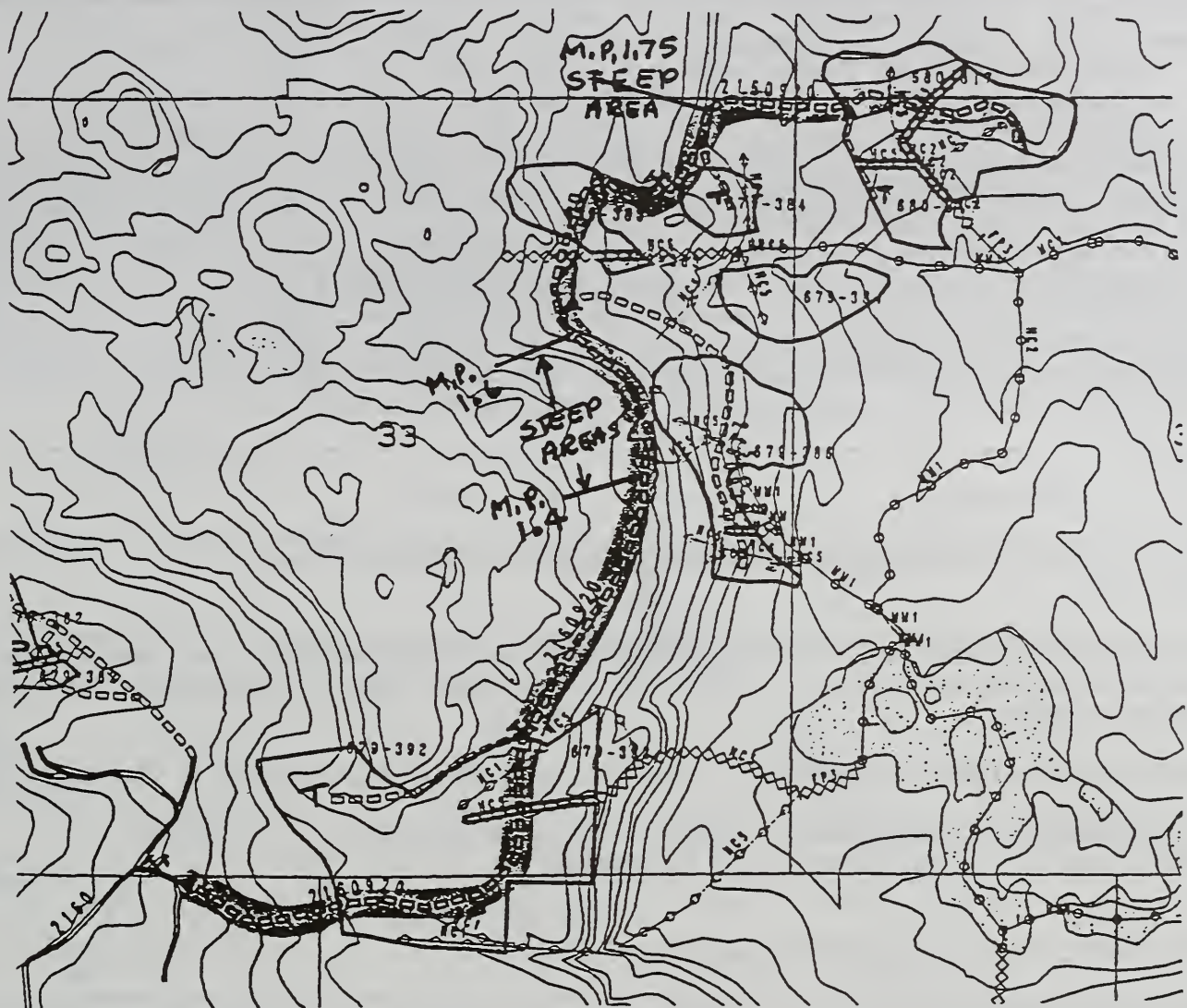
**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** Karst development within unit, road construction should minimize clearing limits and disturbance during construction. road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be reviewed by both Forest Geologist and District Fisheries staff.

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI activities in 15-25 yrs. 3/4 mile access to planned planting TSI access > 1 mile.

**AS LOCATED:**





- X Rock Quarry
- 0-0-0- CLASS I Streams
- 1-1-1- CLASS II Streams
- ◇◇◇◇ CLASS III Streams
- ◇◇◇◇ CLASS IV Streams
- T Temporary roads

- Existing Roads
- Construction
- Reconstruction
- Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Road access the top of unit 386 for logging, this should eliminate the need for a road in the bottom of the unit, logging systems need to verify prior to final location. Final location of this road, if coordinated well with logging systems and other resources should eliminate the need for lower roads with some adjustment to the unit configuration. Most construction will be easy with some sections of difficult construction due to full bench areas and rock outcrops. Grades roll with the topography, overall are adverse with some pitches to 15%. Stream crossings will not require 1200mm dia. or greater cmp unless streams are reclassified to require passage, cmps may want to be oversized to 1200mm to accommodate the passage requirements. Side slope gradients exceed 67% in areas m.p. 1.4 to m.p.1.6 and m.p.1.75, BMP 14.7 applies. Full bench and endhaul where appropriate to protect resources.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map may be in limestone areas.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160928** M.P. **0.00** to M.P. **0.60**  
Sale/Offering Area **ROD Road #(s)**  
**NEW** Construction (New or RE) Planned Length **0.60** Actual Length  
Unit(s) accessed **679-386** Road Locator: **Oien**

**Road Management Objectives:**

Funcnt Class **L** Traffic Service Level **D** Hgw. Safety Act No **Design Veh: LT**  
Critical Veh: **LT** Maint Level: Active Sale **2** Post Sale **1**

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage ☐ Accept ☐ Discourage ☐ Eliminate ☒ Prohibit ☐  
This road system is not connected to any public road system.

Closure Devices: Barrier,

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Closed status after initial entry.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED: No Concerns**  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Some Class IV streams may require timing depending on final road locations and vicinity of class II or I streams. Timing to be determined by District Biologist after final road location is complete.

**RECON/PLANNED STREAM CROSSINGS: 0 CLASS I 0 CLASS II 0 CLASS III 4 CLASS IV**

**AS LOCATED STREAM CROSSINGS: CLASS I CLASS II CLASS III CLASS IV**  
**CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING**

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED:** Forested wetlands are unavoidable along this location. Minimize road width and maintain natural drainage to extent possible.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED: No Concerns**

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED: No Concerns**

**AS LOCATED:**

**CULTURAL RECON/PLANNED: No Concerns**

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED: No concerns**

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED: TSI activities in 25+ years. Short access**

**AS LOCATED:**



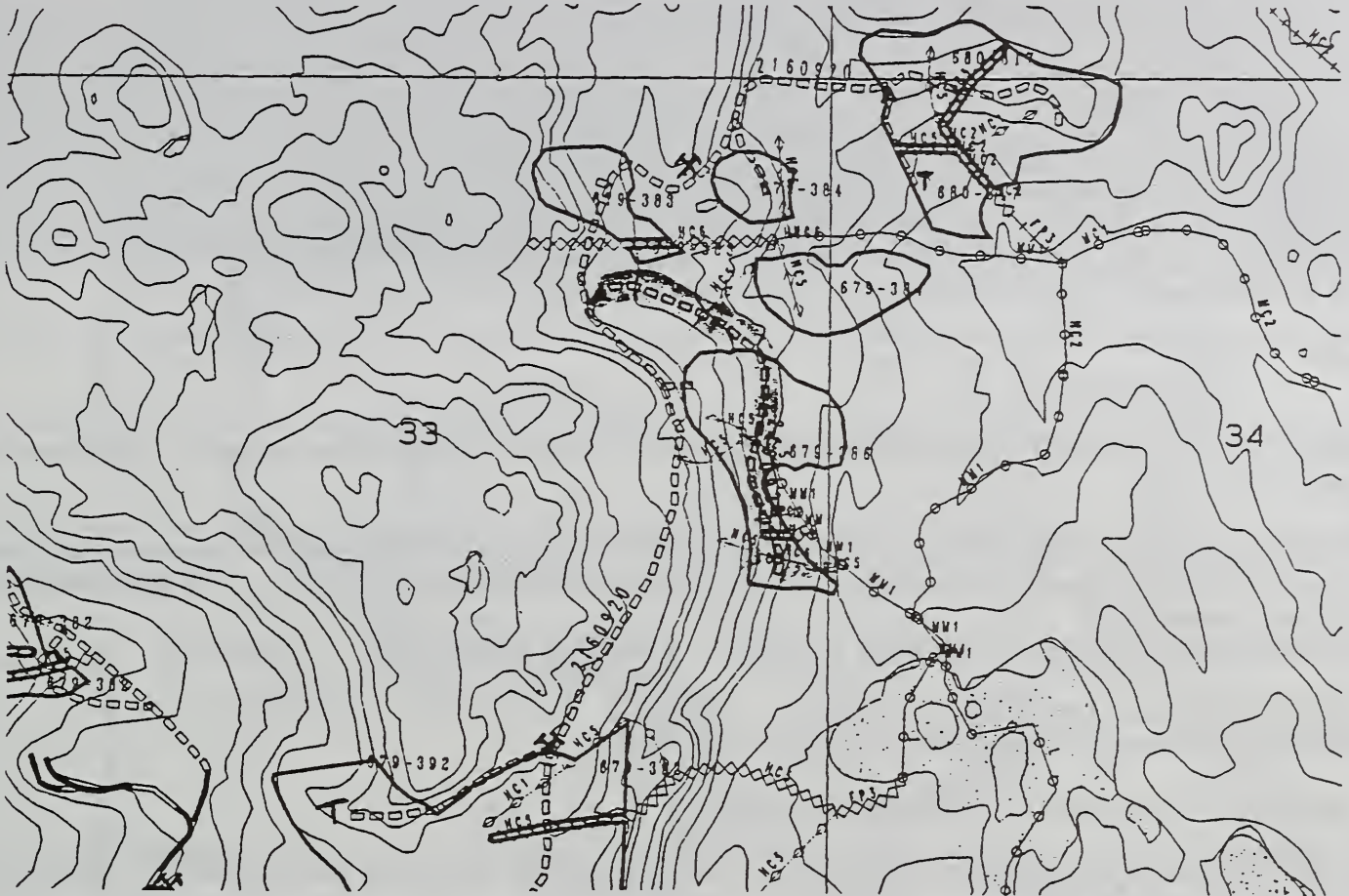
Road #2160928 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 390-224

^  
 //  
 |  
 |  
 |  
 N



- X Rock Quarry
- 0--0--0-- CLASS I Streams
- I--I--I-- CLASS II Streams
- ◇◇◇◇ CLASS III Streams
- ◇-◇-◇-◇- CLASS IV Streams
- T Temporary roads

- Existing Roads
- Construction
- Reconstruction
- Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Road access the top of unit 386 for logging, road 2160920, this should eliminate the need for this road in the bottom of the unit, logging systems need to verify prior to final location. Most construction will be easy with some sections of difficult construction due to full bench areas and rock outcrops. Grades roll with the topography, overall are adverse with some pitches to 15%. Stream crossing will not require 1200mm dia. or greater cmp unless streams are reclassified to require passage.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map may be in limestone areas.



11/10/97

ROAD CARD: RECON/PLANNING/AS LOCATED

EIS Name Chasina Road No. 2160850 M.P. 0.00 to M.P. 3.1  
Sale/Offering Area ROD Road #(s)  
NEW Construction (New or RE) Planned Length 3.1 Actual Length  
Unit(s) accessed 681-304,680-330 Road Locator Oien

Road Management Objectives:

Funct Class L Traffic Service Level D Hgw Safety Act No Design Veh. LT

Critical Veh. LB Maint Level Active Sale 2 Post Sale F

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage Eliminate X Prohibit X

This road system is not connected to any public or community road system.

Closure Devices: Barrier

Erosion Control: water bars a maximum of 500ft. spacing on level 1 roads.

AFRPR Closure Status: Active during sale activities. Inactive m.p. 0.00 to m.p. 1.9, closed m.p. 1.9 to m.p. 3.1.

Approved:

District Ranger

Date

TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED: Moderate salvage potential along this road system.  
AS LOCATED:

FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED: Final road location should minimize impacts to TTRA buffers. Timing and passage on Class I & II streams. Timing on Class III streams will be determined after final road location is complete.

RECON/PLANNED STREAM CROSSINGS: 4 CLASS I 0 CLASS II 2 CLASS III 5 CLASS IV

AS LOCATED STREAM CROSSINGS: CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

AS LOCATED CATALOGED STREAM CROSSINGS:

SOILS/WATER /WETLANDS RECON/PLANNED: Forested wetlands are unavoidable along this location. Minimize road width and maintain natural drainage to extent possible.

AS LOCATED:

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5--14.14

WILDLIFE RECON/PLANNED: Road location is within 1/2 mile of known bald eagle nesting site. Follow interagency agreement with USFWS.

AS LOCATED:

VISUAL/RECREATION RECON/PLANNED: No Concerns

AS LOCATED:

CULTURAL RECON/PLANNED: No Concerns

AS LOCATED:

LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED: No Concerns

AS LOCATED:

SILVICULTURE: RECON/PLANNED: Maintain access to m.p. 1.9, for future TSI in 25 years and planting within 5 yrs. in unit 680-330.

AS LOCATED:

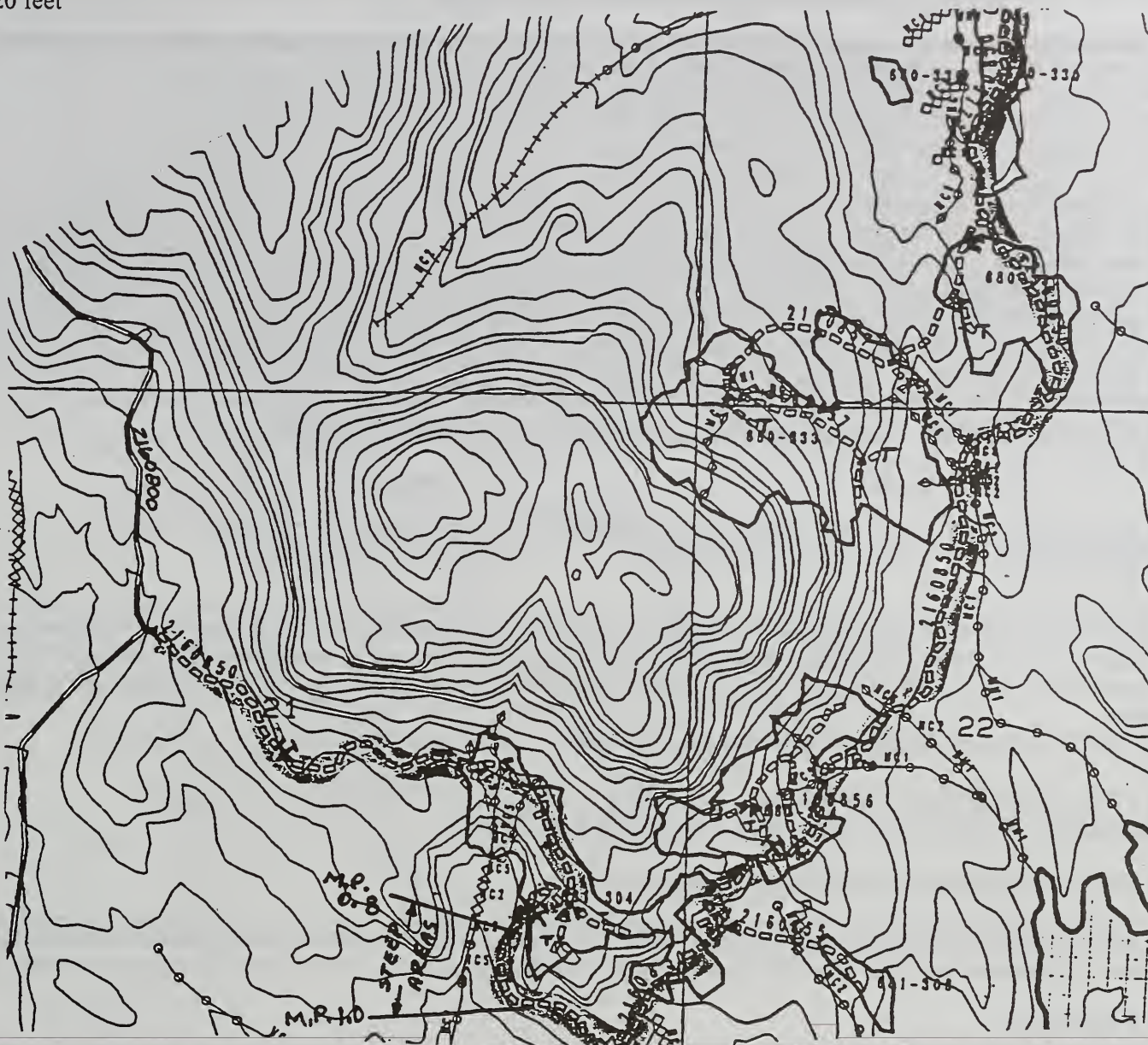


Road #2160850 Map #: CRG A-1  
SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 390-218



- X Rock Quarry
- 0-0-0- CLASS I Streams
- I-I-I- CLASS II Streams
- ◇◇◇◇ CLASS III Streams
- ◇◇◇◇ CLASS IV Streams
- T Temporary roads

- Existing Roads
- Construction
- Reconstruction
- Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

CLASS I crossings will require 1200mm or larger cmp. Crossings at M.P. 1.9 and beyond may be installed as temporary bridges to facilitate removal and road closure at completion of post sale activities. Class I streams are 6-10 percent gradient, all less than 1.2 meters wide, recommend oversizing cmps to accomadate burying pipe in stream bed for passage. Use temp bridge crossings where ever possible to facilitate removal and road closure at a later time if road management dictates. Road grades roll to fit topography not exceeding 15% adverse pitches. Most construction is easy to moderate with one section 100 meters long of full bench rock. Side slope gradients exceed 67% in some areas m.p. 0.8 to m.p. 1.0, BMP 14.7 applies. Full bench and endhaul where appropriate to protect resources.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name Chasina Road No. 2160855 M.P. 0.00 to M.P. 0.30

Sale/Offering Area ROD Road #(s)

NEW Construction (New or RE) Planned Length 0.30 Actual Length

Unit(s) accessed 681-308 Road Locator: Oien

**Road Management Objectives:**

Funct Class L Traffic Service Level D Hgw. Safety Act No. Design Veh: LT

Critical Veh: LB Maint Level: Active Sale 2 Post Sale I

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage Eliminate X Prohibit

This road system is not connected to any public or community road system.

Closure Devices: Barrier,

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Closed status after initial entry.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED: No Concerns**

**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Road locations should minimize impacts to TTRA buffers. Timing and passage required on Class I streams. Timing will be determined after final location is complete. GIS mapping shows a CLASS I stream crossing, field recon has determined this to be a CLASS II O/W stream and is flagged so on the ground.

**RECON/PLANNED STREAM CROSSINGS:** 1 CLASS I 0 CLASS II 0 CLASS III 0 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

**CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING**

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED:** Wetlands are unavoidable on this road location, location on wetlands are to be kept at a minimum and only where no other practical alternative is available. No endhaul material to be placed on wetland areas.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED:** Road construction within 1/2 mile of known bald eagle nesting site. Follow interagency agreement with USFWS.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED: No Concerns**

**AS LOCATED:**

**CULTURAL RECON/PLANNED: No Concerns**

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED: No Concerns**

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI in 25 years. No planting planned, 1/4 mile access.

**AS LOCATED:**

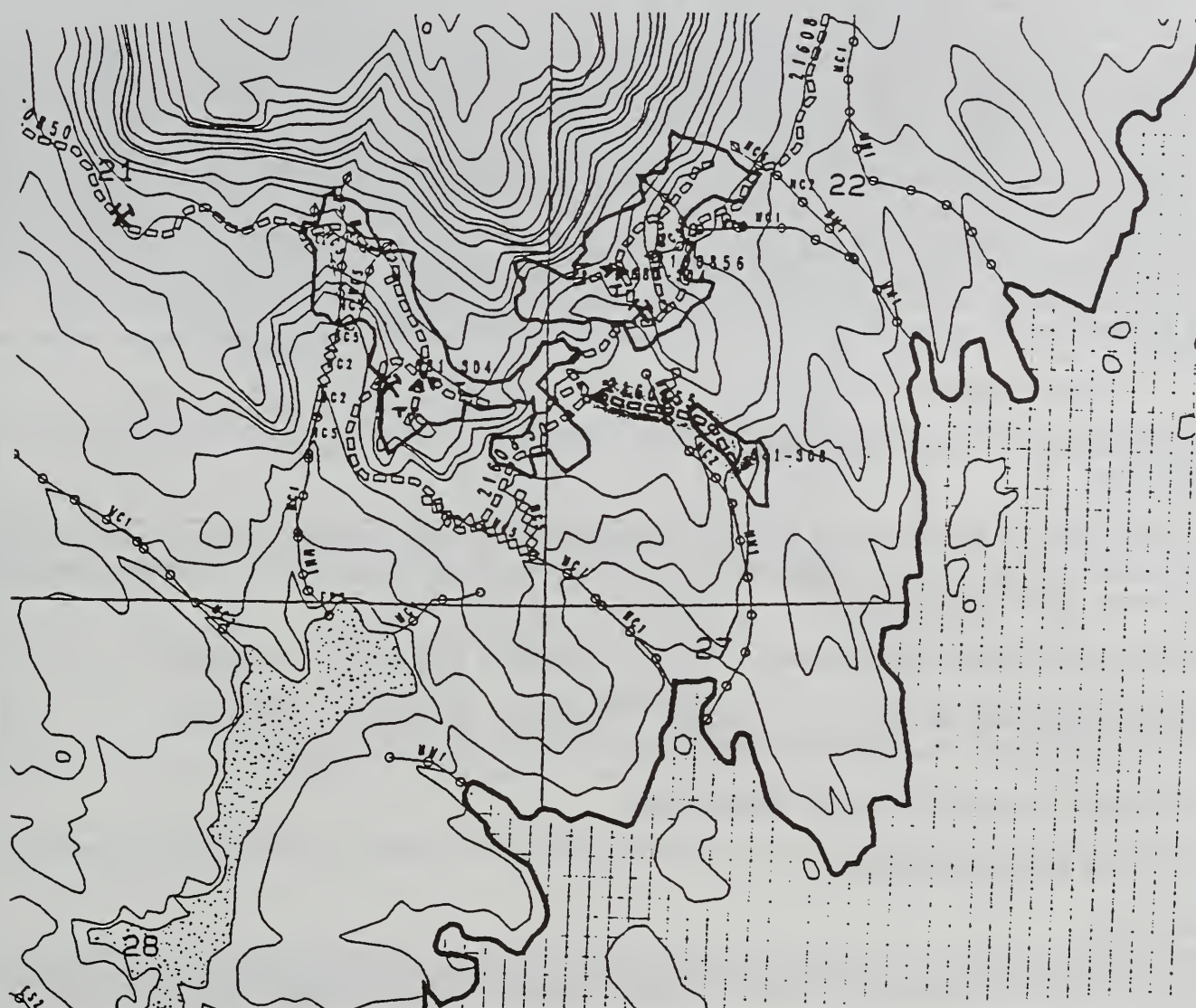


Road #2160855 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 390-218



X Rock Quarry  
 -0-0-0- CLASS I Streams  
 -I-I-I- CLASS II Streams  
 ◇◇◇◇ CLASS III Streams  
 ◇-◇-◇- CLASS IV Streams  
 T Temporary roads

Existing Roads  
 Construction  
 Reconstruction  
 Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Road will access no other resources in the area so elimination of access is appropriate. Recommend all roads be built to minimum standards and temp roads be used whenever possible. Stream crossing will be with cmp less than 1200 mm dia. or use of temporary crossing structure. CMP on the Class I stream (flagged as Class II O/W) will have +/- 3m fill. road grades are 10-15% adverse, easy road construction, no full bench.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name: Chasina Road No. 2160856 M.P. 0.00 to M.P. 0.23  
Sale/Offering Area: ROD Road #(s)  
NEW Construction (New or RE) Planned Length 0.23 Actual Length  
Unit(s) accessed 680-304 Road Locator: Oien

**Road Management Objectives:**

Funct Class: L Traffic Service Level: D Hgw. Safety Act No. Design Veh: LT

Critical Veh: LB Maint Level: Active Sale 2 Post Sale 1

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage Eliminate X Prohibit

This road system is not connected to any public or community road system.

Closure Devices: Barrier,

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Closed status after initial entry.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED: No Concerns**  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Road locations should minimize impacts to TTRA buffers. Timing and passage required on Class IV streams depending on vicinity to Class I streams. Timing will be determined after final location is complete.

**RECON/PLANNED STREAM CROSSINGS:** CLASS I 0 CLASS II 0 CLASS III 2 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER RECON/PLANNED:**

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED:** Road construction within 1/2 mile of known bald eagle nesting site. Follow interagency agreement with USFWS.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED: No Concerns**

**AS LOCATED:**

**CULTURAL RECON/PLANNED: No Concerns**

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED: No Concerns**

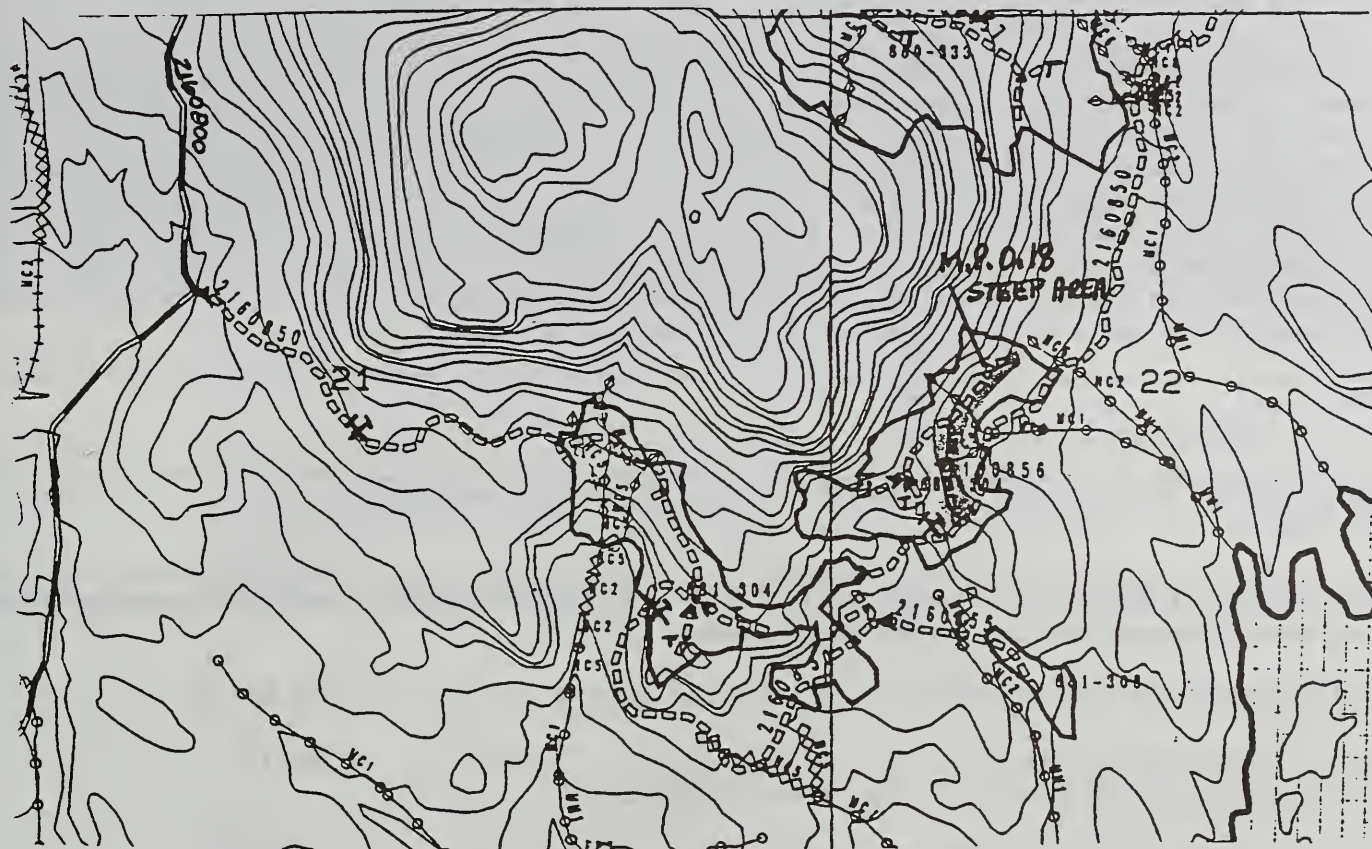
**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI in 25 years. No planting planned, short access.

**AS LOCATED:**



^  
N  
||  
N



- X Rock Quarry  
 -0-0-0- CLASS I Streams  
 -I-I-I- CLASS II Streams  
 <-->--> CLASS III Streams  
 <-->--> CLASS IV Streams  
 T Temporary roads

- Existing Roads  
 Construction  
 Reconstruction  
 Harvest unit

#### Recon/Location Narrative/Design Considerations: (Major drainages, road grades, future access, etc.)

Road will access no other resources in the area so elimination of access is appropriate. Recommend all roads be built to minimum standards and temp roads be used whenever possible. Road location utilizes benches on the ground whenever possible, may be some full bench construction in steep areas between benches. Road grades favorable to 15%. Culvert installations should be low impact, crossdrains on CLASS IV streams. Use temp crossings whenever possible to facilitate removal and road closure. Side slope gradients exceed 67% in some areas m.p. 0.18 to m.p. 0.20, BMP 14.7 applies. Full bench and endhaul where appropriate to protect resources.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name Chasina Road No. 2160857 M.P. 0.00 to M.P. 0.80

Sale/Offering Area ROD Road #(s)

NEW Construction (New or RE) Planned Length 0.8 Actual Length

Unit(s) accessed 680-333 Road Locator: Oien

**Road Management Objectives:**

Funct Class L Traffic Service Level D Hgw. Safety Act No Design Veh: LT

Critical Veh: LB Maint Level: Active Sale 2 Post Sale 1

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage Eliminate X Prohibit

This road system is not connected to any public or community road system.

Closure Devices: Barrier,

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Closed status after initial entry.

**Approved:**

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Timing may be required on class IV streams and will be determined after final road location is complete.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 0 CLASS II 0 CLASS III 2 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED:** Forested wetlands are unavoidable along this location. Minimize road width and maintain natural drainage to extent possible.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14

**WILDLIFE RECON/PLANNED:** Road location within 1/2 mile of known bald eagle nesting site. Follow interagency agreement with USFWS.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** No Concerns

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI in 20-25 years. No planting planned, less than 1 mile access.

**AS LOCATED:**

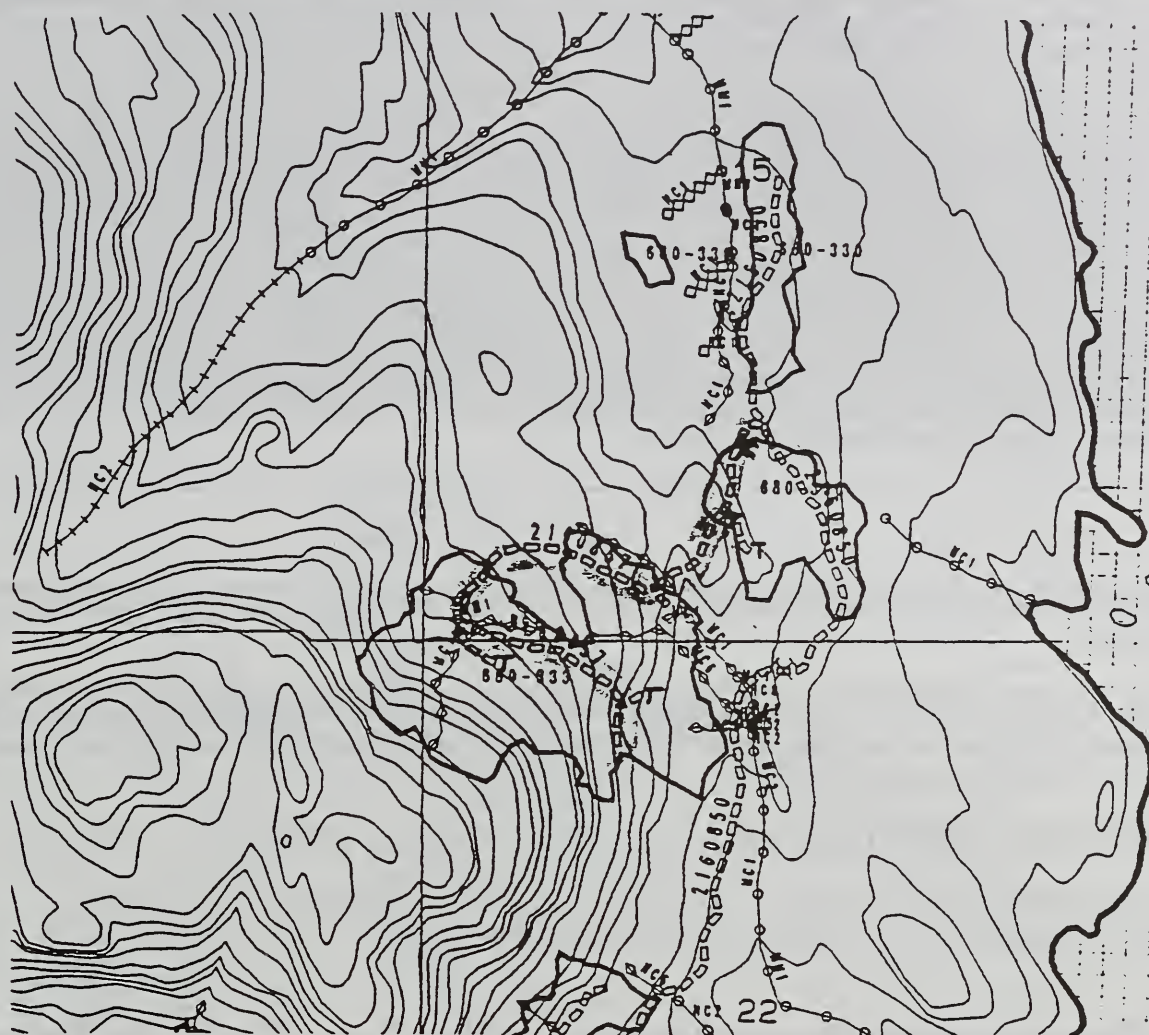


Road #2160857 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 390-218,219



|         |                   |                |
|---------|-------------------|----------------|
| X       | Rock Quarry       | Existing Roads |
| -0-0-0- | CLASS I Streams   | Construction   |
| -I-I-I- | CLASS II Streams  | Reconstruction |
| ◇◇◇◇    | CLASS III Streams | Harvest unit   |
| ◇◇◇◇    | CLASS IV Streams  |                |
| T       | Temporary roads   |                |

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Road will access no other resources in the area so elimination of access is appropriate. Recommend all roads be built to minimum standards and temp roads be used whenever possible. No major drainages crossed, CLASS IV streams will require small 600mm dia. cmps. Road grades are favorable to 15%. Road construction easy to moderate, no significant full bench construction required.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160890** M.P. **0.00** to M.P. **0.25**

Sale/Offering Area ROD Road #(s)

RE Construction (New or RE) Planned Length **0.25** Actual Length

Unit(s) accessed **LTF** Road Locator: **Oien**

**Road Management Objectives:**

Func Class **L** Traffic Service Level **D** Hgw. Safety Act No Design Veh: **LT**

Critical Veh: **LB** Maint Level: Active Sale **2** Post Sale **1**

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage **X** Eliminate Prohibit

This road system does not connect to any public road system

Closure Devices: Barrier

Erosion Control: Maintain road and monitor all maintenance activities.

AFRPR Closure Status: Active during sale activities.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** Access to LTF for all salvage and small sales.  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Timing may be required on class III streams depending on final road location. Timing determination will be made after final road location is complete. One Class III stream indicated below is an existing culvert.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 0 CLASS II 1 CLASS III 0 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED:** No concerns

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.14

**WILDLIFE RECON/PLANNED:** Road may be within 1/2 mile of known bald eagle nesting site, follow interagency agreement with USFWS during construction.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** No Concerns

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** Maintain access for future TSI and planting in 15-25 years. Planting anticipated within 5 yrs. at end of road > 1.5 miles.

**AS LOCATED:**

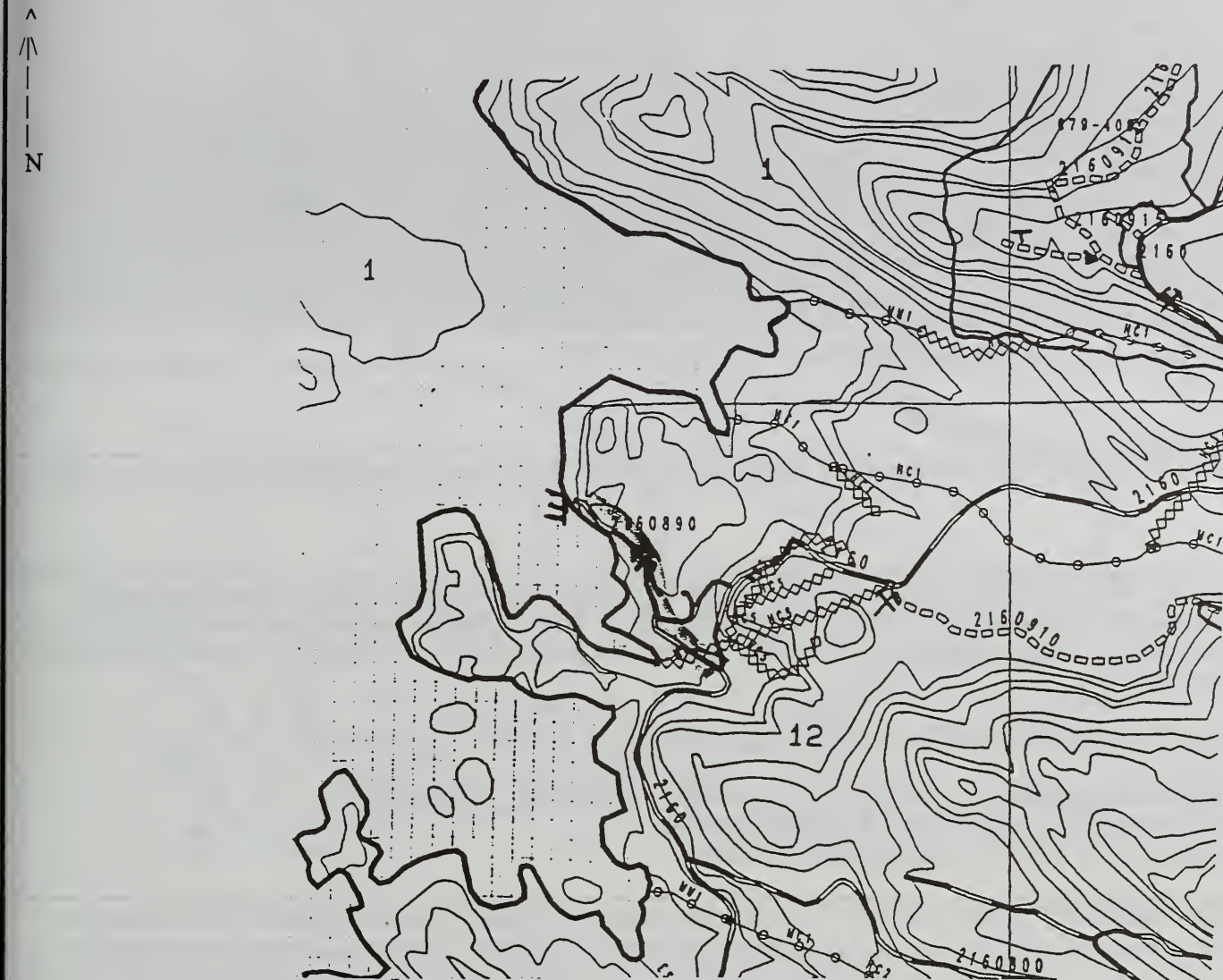


Road #2160890 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 390-163



- |                 |                   |           |                |
|-----------------|-------------------|-----------|----------------|
| X               | Rock Quarry       | — — — — — | Existing Roads |
| --0--0--0--     | CLASS I Stream    | □ □ □ □   | Construction   |
| --I--I--I--I--  | CLASS II Stream   | — — — — — | Reconstruction |
| ◇ ◇ ◇ ◇         | CLASS III Streams | — — — — — | Harvest unit   |
| ◇ — ◇ — ◇ — ◇ — | CLASS IV Streams  |           |                |
| T               | Temporary roads   |           |                |

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Reconstruction on this road will be minimal. Road access Barge facility(LTF) LTF crib wall will need extensive maintenance. No change in marine footprint. Facility to be accessed for NPDES conformity and any corrections deemed necessary will be made.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map .



11/10/97

ROAD CARD: RECON/PLANNING/AS LOCATED

EIS Name Chasina Road No. 2160982 M.P. 0.00 to M.P.0.75  
Sale/Offering Area ROD Road #(s)  
NEW Construction (New or RE) Planned Length 0.75 Actual Length  
Unit(s) accessed 678-312 Road Locator: Oien

Road Management Objectives:

Func Class L Traffic Service Level D Hgw Safety Act No Design Veh LT

Critical Veh: LB Maint Level: Active Sale 2 Post Sale 1

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage X Eliminate Prohibit

This road system is not connected to any public road system.

Closure Devices: Barrier

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Close after initial entry.

Approved:

District Ranger

Date

TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED: Future settings and salvage opportunities on this road system.

AS LOCATED:

FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED: Class I streams require timing and passage depending on final road location. Some Class III streams may require timing depending on final road location, proximity to fish habitat, bank stability and transport capabilities. Timing and passage requirements will be determined by district biologist after final road location is complete.

RECON/PLANNED STREAM CROSSINGS: 1 CLASS I 0 CLASS II 0 CLASS III 0 CLASS IV

AS LOCATED STREAM CROSSINGS:    CLASS I    CLASS II    CLASS III    CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

AS LOCATED CATALOGED STREAM CROSSINGS: NONE

SOILS/WATER/WETLANDS RECON/PLANNED: Road location will avoid wetlands whenever possible. Road location on wetlands to be kept to a minimum and only where no other practical alternative is available. No endhaul material to be placed on wetland areas.

AS LOCATED:

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's; 14.2-14.3, 14.5-14.14

WILDLIFE RECON/PLANNED: Planned road location is within 1/2 mile of known bald eagle nesting site. Follow interagency agreement with USFWS.

AS LOCATED:

VISUAL/RECREATION RECON/PLANNED: No Concerns

AS LOCATED:

CULTURAL RECON/PLANNED: No Concerns

AS LOCATED:

LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED: Karst development within unit, road construction should minimize clearing limits and disturbance during construction. road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be reviewed by both Forest Geologist and District Fisheries staff.

AS LOCATED:

SILVICULTURE: RECON/PLANNED: TSI in 15-25 years, less than 1 mile access from the west. No planting anticipated..

AS LOCATED:



Road #2160982 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 590-65



- X Rock Quarry
- 0-0-0- Class I Stream
- 1-1-1- Class II Stream
- ◇◇◇◇◇ Class III Streams
- ◇◇◇◇◇ CLASS IV Streams
- T Temporary roads
- \* Eagle Nest Site

- Existing Roads
- Construction
- Reconstruction
- Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Road flagged in white and portions in blue polkadot flagging. There are Karst concerns in the area but these can be avoided in final location by working with logging systems and karst resource personnel(See Baichtal report). One Class I stream crossed that will require a 1200mm dia. or greater cmp to accommodate passage requirements.. Road grades will roll with pitches both favorable and adverse to 15% to accommodate ground topog and Karst concerns. Road construction should be moderate to easy with a high percentage of rock excavation.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map may be in limestone areas.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name Chasina Road No. 2160800 M.P. 0.00 to M.P. 4.10  
Sale/Offering Area ROD Road #(s)  
NEW & RE Construction (New or RE) Planned Length 4.1 Actual Length  
Unit(s) accessed 679-420 and E.Dolomi units Road Locator: oien

**Road Management Objectives:**

Funct Class L Traffic Service Level D Hgw. Safety Act No Design Veh: LT  
Critical Veh: LB Maint Level: Active Sale 2 Post Sale 1

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage X Eliminate Prohibit

This road system is not connected to any public or community road system.

Closure Devices: Gate

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Active post sale.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** High salvage potential along this system.  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** All crossings of streams are existing crossings. Repair to existing culverts will be completed per road condition survey completed by biologists during 1997 field season, survey is located in appendix J of FEIS. Timing requirements will be determined after final road reconstruction package is complete. No streams crossed on new construction(0.10 total new construction)

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 2 CLASS II 4 CLASS III CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

**CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING**

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER/WETLANDS RECON/PLANNED:** NO CONCERNS, EXISTING ROAD.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED:** No Concerns

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** No Concerns

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI activities in 20-3- years, no planting planned. Maintain for TSI within 5 yrs(existing units)

**AS LOCATED:**





X Rock Quarry

-0--0--0-- CLASS I Streams

-I--I--I-- CLASS II Streams

◇◇◇◇◇ CLASS III Streams

◇--◇--◇-- CLASS IV Streams

T Temporary roads



Existing Roads



Construction



Reconstruction



Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

This section includes a 500ft. section of new construction that ties the FS road system to the Kootznoowoo roads. Easement has been obtained from Kootznoowoo for use of their roads. No streams encountered on this section. No major(1200mm) cmp's to be installed or replaced on this new section. CMP repairs to be done per 1997 road condition survey.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160980** M.P. **0.00** to M.P. **3.00**  
Sale/Offering Area ROD Road #(s)  
NEW Construction (New or RE) Planned Length **3.00** Actual Length  
Unit(s) accessed **678-303,310,316,319** Road Locator: **Oien**

**Road Management Objectives:**

Funcit Class **L** Traffic Service Level **D** Hgw. Safety Act No. Design Veh: **LT**

Critical Veh: **LB** Maint Level: Active Safe **2** Post Sale **1**

Intended Purpose and Use: **silvicultural purposes**

Management Strategy: Encourage ☐ Accept ☐ Discourage ☒ Eliminate ☐ Prohibit ☐

This road system is not connected to any public road system.

Closure Devices: **Barrier,**

Erosion Control: **water bar**

AFRPR Closure Status: **Active during sale activities. Inactive status after initial entry for other silvicultural activities.**

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** Future settings and salvage opportunities on this road system.

**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Class II streams require timing and passage depending on final road location. Timing and passage requirements will be determined by district biologist after final road location is complete.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 2 CLASS II 0 CLASS III

**AS LOCATED STREAM CROSSINGS:**    CLASS I    CLASS II    CLASS III

**CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING**

**AS LOCATED CATALOGED STREAM CROSSINGS:** **NONE**

**SOILS/WATER/WETLANDS RECON/PLANNED:** Road location will avoid wetlands whenever possible. Road location on wetlands to be kept to a minimum and only where no other practical alternative is available. No endhaul material to be placed on wetland areas.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's; 14.2-14.3, 14.5-14.14

**WILDLIFE RECON/PLANNED:** Planned road location is within 1/2 mile of known bald eagle nesting site. Follow interagency agreement with USFWS.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** Karst development within unit, road construction should minimize clearing limits and disturbance during construction. road and ditch construction should not direct surface runoff into collapse features and sinkholes adjacent to alignment. Timing of road construction should insure that grass seeding is accomplished so that cut slopes are vegetated before fall. Quarry placement and development should be reviewed by both Forest Geologist and District Fisheries staff.

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** Maintain access for future TSI in 15-25 years. Planting anticipated within 5 yrs at end of road > 1.5 miles.

**AS LOCATED:**

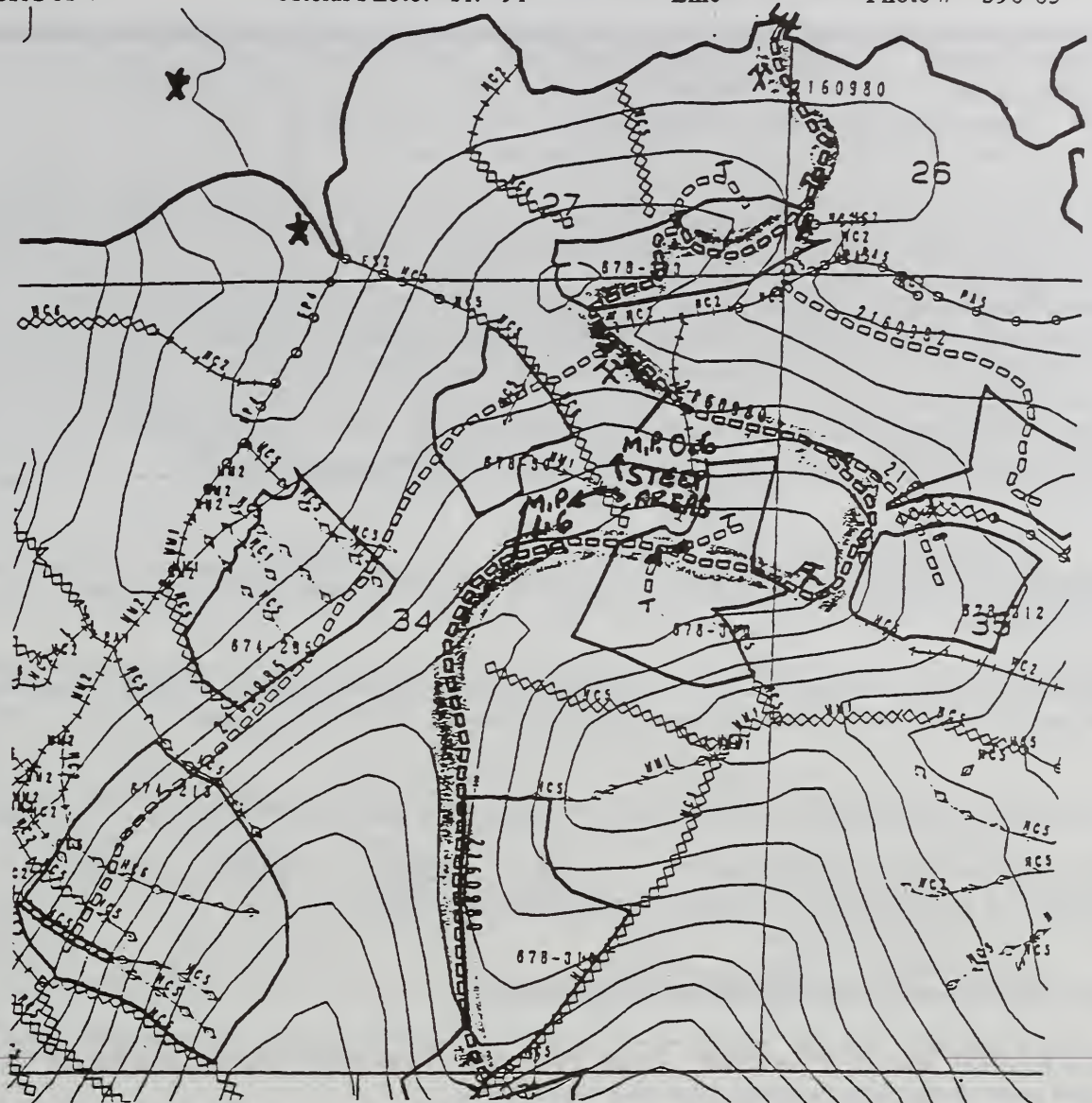


Road #2160980 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 590-65



|         |                   |  |                |
|---------|-------------------|--|----------------|
| X       | Rock Quarry       |  | Existing Roads |
| -0-0-0- | Class I Stream    |  | Construction   |
| -1-1-1- | Class II Stream   |  | Reconstruction |
|         | Class III Streams |  | Harvest unit   |
|         | CLASS IV Streams  |  |                |
| T       | Temporary roads   |  |                |
| *       | Eagle Nest Site   |  |                |

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Road flagged in white and portions in blue polkadot flagging. There are Karst concerns in the area but these can be avoided in final location by working with logging systems and karst resource personnel (See Baichtal report). No Class I streams crossed, Class II streams crossed will not require 1200mm dia. or greater cmp. Road grades are favorable to 15% with one section to 19% grade to stay on more moderate ground. Construction will be moderate to difficult in some areas. Full bench construction will be necessary for portions. Side slope gradients exceed 67% in some areas m.p. 0.6 to m.p. 1.6, BMP 14.7 applies. Full bench and endhaul where appropriate to protect resources. Final location to avoid steep sideslopes by utilizing benches where possible.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map may be in limestone areas.



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name Chasina Road No. 2160910 M.P. 0.00 to M.P. 1.40  
Sale/Offering Area ROD Road #(s)  
NEW Construction (New or RE) Planned Length 1.40 Actual Length  
Unit(s) accessed 679-414 Road Locator: Oien

**Road Management Objectives:**

Function Class L Traffic Service Level D Hgw. Safety Act No Design Veh: LT  
Critical Veh: LB Maint Level: Active Sale 2 Post Sale 1

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage Eliminate Prohibit X  
This road system does not connect to any public road system

Closure Devices: Barrier,

Erosion Control: waterbars a maximum of 500 apart during inactive status.

AFRPR Closure Status: Active during sale activities. Closed status after initial entry.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** No Concerns  
**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Timing may be required on streams crossings depending on final road location and proximity to the class I and II streams.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 0 CLASS II 0 CLASS III 5 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV  
CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER RECON/PLANNED:** Areas of wetlands are unavoidable due to topograph and road grade restrictions. Most practical route chosen when wetlands areas were encountered.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.

**WILDLIFE RECON/PLANNED:** Coordinate final road locations to avoid sensitive plant species where feasible. Platanthera chorisiana were found in the vicinity of units 407 & 414. Road may be within 1/2 mile of known bald eagle nesting site, follow interagency agreement with USFWS during construction.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns  
**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns  
**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** No Concerns  
**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** No concerns. TSI and planting planned, short access.  
**AS LOCATED:**



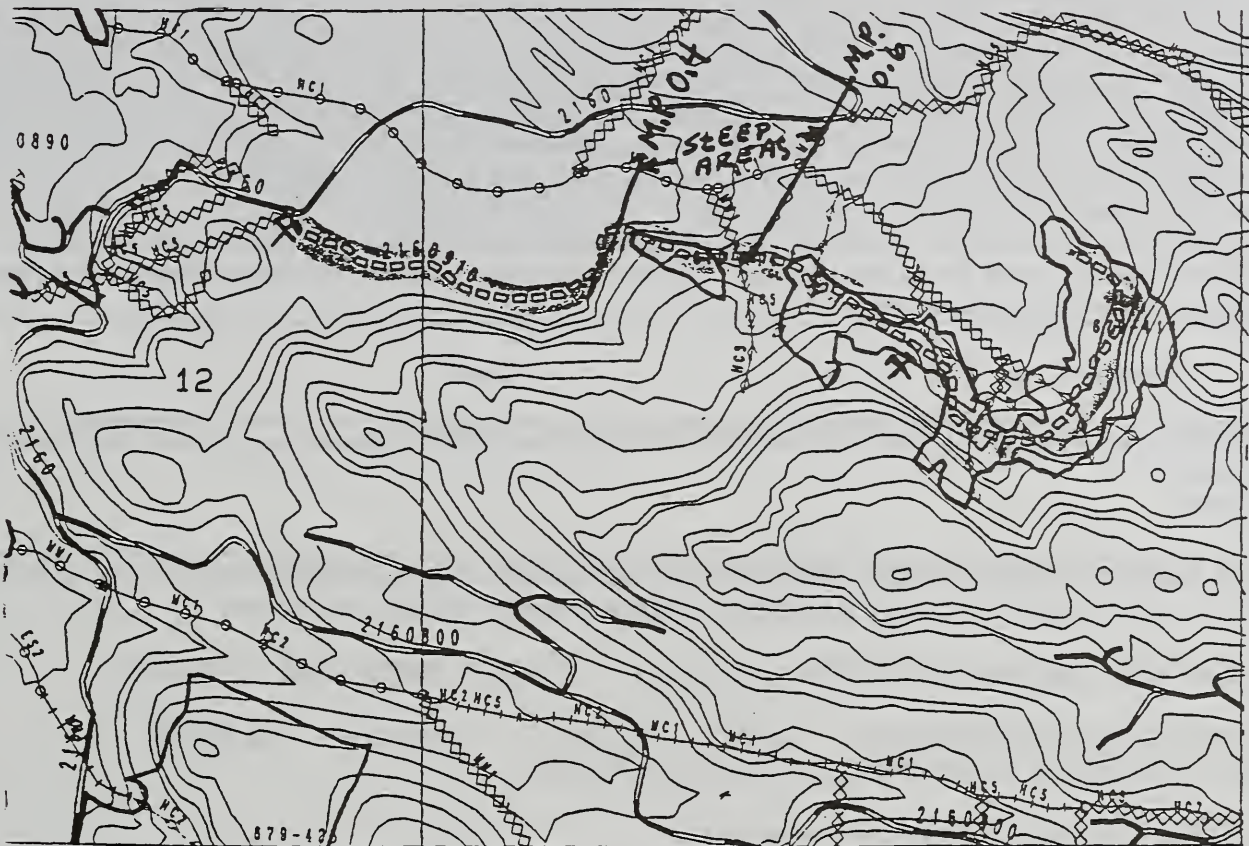
Road #2160910 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo # 390-163

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 N



- X Rock Quarry
- 0-0-0-0- CLASS I Stream
- I-I-I-I- CLASS II Stream
- ◇◇◇◇ CLASS III Streams
- ◇-◇-◇-◇ CLASS IV Streams
- T Temporary roads

- Existing Roads
- Construction
- Reconstruction
- Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)  
 Road reconned as planned. Alternate route reconned to area(not flagged) from switchback on 2160 road, route is feasible but crosses more streams, wetlands and accesses no additional resources. Timing may be required on stream crossings due to vicinity of Class I streams, flagged as B/W. All streams are low gradient low flow streams requiring less than 1200mm dia. cmps. Road grades are favorable to 15%(pitches) with easy to moderate construction required over the entire location. Side slope gradients exceed 67% in some areas m.p. 0.4 to m.p.0.6, BMP 14.7 applies. Full bench and endhaul where appropriate to protect resources.  
**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map .



11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160000(Chasina Pt.)** M.P. **0.00** to M.P. **4.0**  
Sale/Offering Area ROD Road #(s)  
NEW Construction (New or RE) Planned Length **4.0** Actual Length  
Unit(s) accessed **679-382,378,367,363,501,680-310** Road Locator: **Oien /Rousso/Wilt**

**Road Management Objectives:**

Funcit Class **L** Traffic Service Level **D** Hgw. Safety Act No. Design Veh: **LT**

Critical Veh: **LB** Maint Level: Active Sale **2** Post Sale **1**

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage **X** Eliminate **X** Prohibit

This road system is not connected to any public road system.

Closure Devices: Barrier,

Erosion Control: water bars on level 1 roads with no barrier, maximum spacing 500 ft. and over cross drain cmps.

AFRPR Closure Status: Active during sale activities. Post sale status will be inactive up to m.p. 2.9 and closed from m.p. 2.9 to 4.0 upon completion of all silvicultural activities.

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** Future salvage potential and harvest settings along this road system

**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Timing and passage may be required on class II & III streams. Timing and passage requirements to be determined after final road location.

**RECON/PLANNED STREAM CROSSINGS:** 0 CLASS I 1 CLASS II 10 CLASS III 10 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER RECON/PLANNED:** Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22.(Soils and Watershed Conservation Handbook). Specific BMP's; 14.2,14.3,14.5, 14.6-14. Forested wetlands are unavoidable along this location. Minimize road width and maintain natural drainage to extent possible.

**AS LOCATED:**

**WILDLIFE RECON/PLANNED:** Coordinate final road locations to avoid sensitive plant species where feasible, Platanthera chorisiana were found in the vicinity of unit 679-363. No known bald eagle nest sites within 1/2 mile of road locations.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** No Concerns

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** TSI activities in 20-30 yrs. along most of road. Planting planned along most of road within 5 years., 1 mile accessibility beyond 2.9 mile.

**AS LOCATED:**



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N

SEE ATTACHED MAP

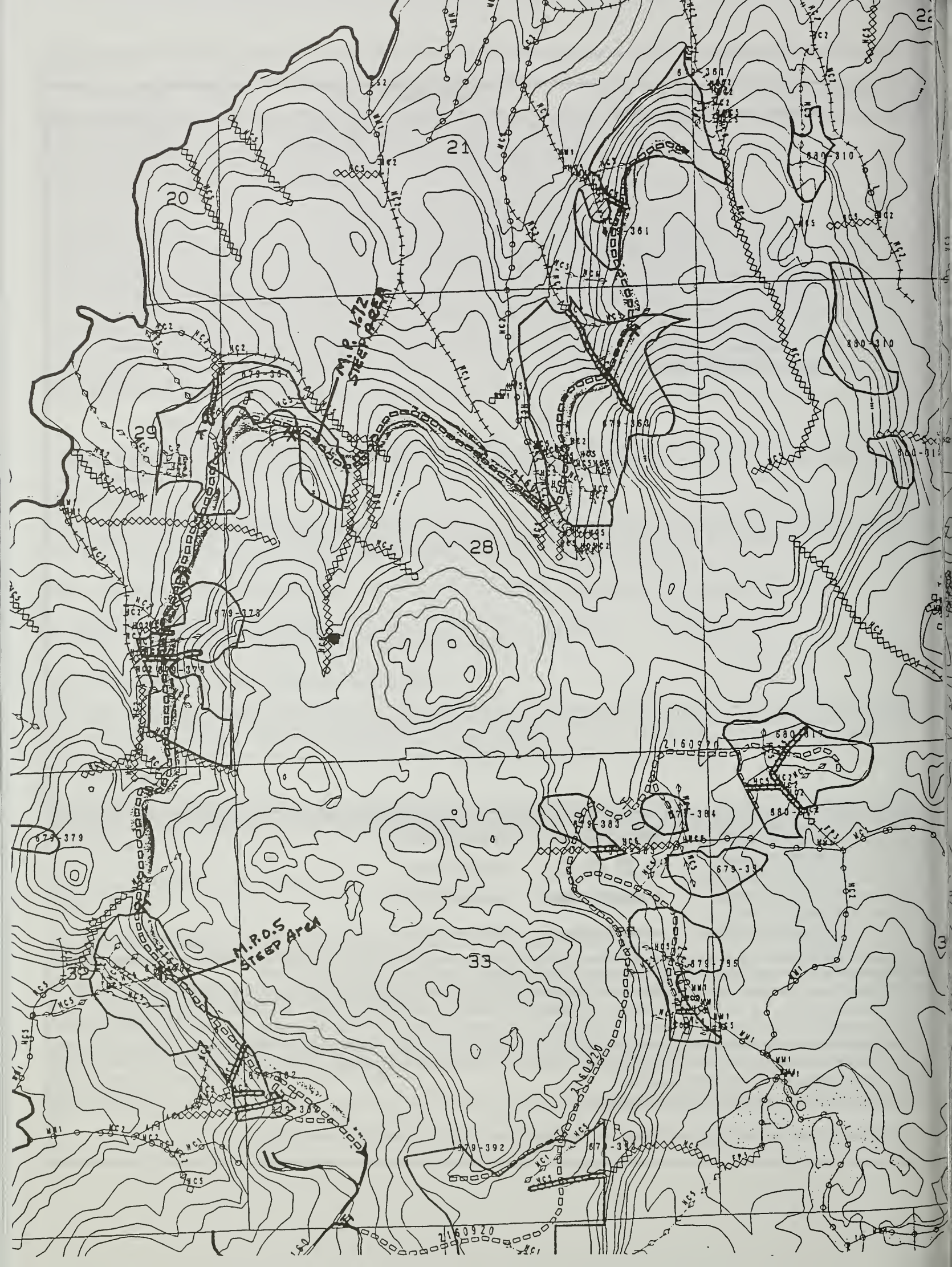
|         |                   |  |                |
|---------|-------------------|--|----------------|
| X       | Rock Quarry       |  | Existing Roads |
| -0-0-0- | CLASS I Streams   |  | Construction   |
| -I-I-I- | CLASS II Streams  |  | Reconstruction |
|         | CLASS III Streams |  | Harvest unit   |
|         | CLASS IV Streams  |  |                |
| T       | Temporary roads   |  |                |

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)  
Road reconned near planned route, logging systems input required in most units before final location is complete. CLASS II, O/W stream crossing m.p. +/- 2.9 will require 1200mm or greater cmp, timing required(June 1 - Sept. 1). Stream width varies, 1 to 1.5 meters in width, 0.25 m in depth. Gradient at the crossing is 12 percent with steps. Culvert will require 3m deep fill, endhaul excess overburden 60 m each side of crossing. Road grades roll over entire road, are generally favorable, with pitches up to 15%. No critical areas of full bench construction. Side slope gradients exceed 67% in areas m.p.0.50 and m.p.1.72, BMP 14.7 applies. Full bench and endhaul where appropriate to protect resources.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns. Pits located as shown on map .





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11/10/97

**ROAD CARD: RECON/PLANNING/AS LOCATED**

EIS Name **Chasina** Road No. **2160787** M.P. **0.00** to M.P. **1.00**  
Sale/Offering Area ROD Road #(s)  
RE Construction (New or RE) Planned Length Actual Length **1.00**  
Unit(s) accessed **679-470,477** Road Locator: **Oien**

**Road Management Objectives:**

Funct Class **L** Traffic Service Level **D** Hgw. Safety Act No Design Veh: **LT**

Critical Veh: **LB** Maint Level: Active Sale **2** Post Sale **1**

Intended Purpose and Use: silvicultural purposes

Management Strategy: Encourage Accept Discourage **X** Eliminate Prohibit

This road system is not connected to any public or community road system

Closure Devices: Barrier, Bridge removal

Erosion Control: water bar

AFRPR Closure Status: Active during sale activities. Inactive for post sale activities. Presently closed by bridge removal m.p. 0.80

Approved:

District Ranger

Date

**TIMBER/LOGGING SYSTEM/ADMINISTRATION RECON/PLANNED:** Future settings and salvage opportunities along this road..

**AS LOCATED:**

**FISHERIES HABITAT PROTECTION STREAM CROSSINGS RECON/PLANNED:** Class I streams will require passage and timing. Timing window to be determined after final road reconstruction package is complete and before implementation begins. All crossings indicated below are existing culverts, m.p. 0.0-0.7. Repair to existing culverts will be completed per road condition survey completed by biologists during 1997 field season, survey is located in appendix J of FEIS

**RECON/PLANNED STREAM CROSSINGS:** 3 CLASS I 0 CLASS II 0 CLASS III 2 CLASS IV

**AS LOCATED STREAM CROSSINGS:** CLASS I CLASS II CLASS III CLASS IV

CROSSING # STREAM ID FLAGGING CLASS PASSAGE TIMING

**AS LOCATED CATALOGED STREAM CROSSINGS:**

**SOILS/WATER /WETLANDS RECON/PLANNED:** Reconstruction will not increase the footprint of the road, no wetlands concerns.

**AS LOCATED:**

Road location, design, construction and maintenance will meet all applicable BMP's per FSH 2509.22. Specific BMP's 14.2-14.3, 14.5-14.14.

**WILDLIFE RECON/PLANNED:** Road location is not within 1/2 mile of any known bald eagle nest sites.

**AS LOCATED:**

**VISUAL/RECREATION RECON/PLANNED:** No Concerns

**AS LOCATED:**

**CULTURAL RECON/PLANNED:** No Concerns

**AS LOCATED:**

**LANDS/MINERALS/GEOLOGY/KARST RECON/PLANNED:** No Concerns

**AS LOCATED:**

**SILVICULTURE: RECON/PLANNED:** Foot access sufficient for future TSI.

**AS LOCATED:**



Road #2160787 Map #: CRG A-1  
 SCALE: 1" = 1320 feet

Aerial Photo: Yr. 91

Line

Photo #



- X Rock Quarry
- 0-0-0- CLASS I Streams
- I-I-I- CLASS II Streams
- ◇◇◇◇ CLASS III Streams
- ◇-◇-◇- CLASS IV Streams
- H Potential Heli Ldgs



Existing Roads



Construction



Reconstruction



Harvest unit

**Recon/Location Narrative/Design Considerations:** (Major drainages, road grades, future access, etc.)

Reconstruction should be minor from M.P. 0.0 to m.p. 0.70 only, existing cmps are all smaller than 1200mm dia. Repair replacement of cmps per road condition survey will be concurrent with timber sale use. Last 0.25 miles of road has been closed by bridge removal on the main class I stream and will remain closed for this project.

**Planned/Implemented:** (describe changes and rational):

**Rock Source(s) Location and Special Mitigation:** No special concerns.





# **Appendix K**

## **Public Comments and Forest Service Responses**



# Appendix K

## Public Comments and Forest Service Responses

# Appendix K

## Responses to Comments

Appendix K includes the written comments received on the Draft EIS and provides Forest Service responses to letters with substantive comments.

Availability of the Draft EIS was announced in the Federal Register on March 7, 1997, with a deadline for public comment listed as April 25, 1997. Copies were mailed to the Distribution List in late February. Notices of the availability of the Draft EIS and announcing the Schedule of public open houses and subsistence hearings were placed in the Ketchikan Daily News and the Island News. Additional notices to radio stations and newspapers in the region were issued.

Subsistence hearings on the Draft EIS were held in Hydaburg and Saxman during the comment period. Open houses were also held in conjunction with the subsistence hearings to describe the analysis process and answer public questions on the Draft EIS. Public comment on the Draft EIS was also accepted at that time. Comments were recorded and transcribed and are included in this appendix following the written comments that were received.

Approximately 13 individuals, organizations, and agencies submitted written comments on the Draft EIS. Even though the comment period officially closed April 25, 1997, letters received after this were accepted and analyzed.

Letters with substantive comments have been coded and the comments within each letter numbered with the code to aid the reader to easily see the Forest Service response to individual comment.

Following is a listing of subsistence hearing comments, and letters with substantive comments, their corresponding codes, and what pages the the comments and letters begin on.

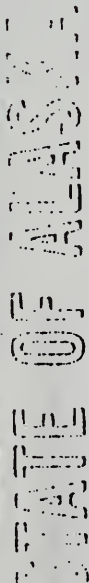


| Letter  | Code  | Page |
|---|-------|------|
| Alaska Department of Governmental Coordination    | DGC   | 3    |
| Clover Bay Floating Fishing Lodge                 | CBFFL | 5    |
| Mike Sallee                                       | MS    | 6    |
| Department of Interior, Fish and Wildlife Service | FWS   | 7    |
| Alaska Department of Fish and Game                | ADF&G | 19   |
| Tongass Conservation Society                      | TCS   | 22   |
| Ketchikan Pulp Company                            | KPC   | 30   |
| City of Saxman                                    |       | 33   |
| Bill Shoaf  | BS    | 34   |
| U.S. Department of Commerce                       | USDC  | 36   |
| Environmental Protection Agency                   | EPA   | 37   |
| Department of the Army, Corps of Engineers        | COE   | 39   |
| Department of Interior, Fish and Wildlife Service | USFWS | 42   |
| National Oceanic and Atmospheric Administration   |       | 44   |
| U. S. Fish and Wildlife Service                   |       | 45   |

#### Subsistence Hearing Comment

|                            |        |
|----------------------------|--------|
| Melvin J. Charles          | 48, 59 |
| Matilda Katherine Kushnick | 49     |
| Pete Amundson              | 54, 60 |
| Tim Bristo                 | 57     |
| Victor Burgess             | 65     |
| Vicky LeCornu              | 66     |
| Vincent Jameson            | 66     |
| Woodrow Morrison           | 67     |

**Comments from Department of  
Governmental Coordination**



**OFFICE OF THE GOVERNOR**

**OFFICE OF MANAGEMENT AND BUDGET  
DIVISION OF GOVERNMENTAL COORDINATION**

☐ **SOUTHCENTRAL REGIONAL OFFICE**  
3401 1<sup>ST</sup> STREET, SUITE 370  
ANCHORAGE, ALASKA 99503-5930  
PH: (907) 269-7470/FAX: (907) 561-6134

☒ **CENTRAL OFFICE**  
P.O. BOX 110030  
JUNEAU, ALASKA 99811-0030  
PH: (907) 465-3552/FAX: (907) 465-3075

☐ **PIPELINE COORDINATOR'S OFFICE**  
411 WEST 4TH AVENUE, SUITE 2C  
ANCHORAGE, ALASKA 99501-2243  
PH: (907) 271-4311/FAX: (907) 272-0689

March 6, 1997

Mr. Bradley Powell, Forest Supervisor  
Ketchikan Area, U.S. Forest Service  
Federal Building  
Ketchikan, AK 99901

Dear Mr. Powell:

**SUBJECT: CHASINA TIMBER SALE DEIS  
STATE I.D. NO. AK 9703-02JJ**

The Division of Governmental Coordination (DGC) received the coastal project questionnaire, applications, required public notice(s), and supporting information you submitted for the State of Alaska's project consistency review. Missing from that packet was a consistency certification, normally submitted for our concurrence under Section 307(c)(3)(A) of the Federal Coastal Zone Management Act as per 15 CFR 930, Subpart D. This letter to inform you that we are initiating a review to obtain NEPA comments and for consistency. The ACMP public notice was made on March 7, 1997.

Appropriate materials have been distributed to participants in the Alaska Coastal Management Program for the review and comments. Review participants, milestones, and the associated permits are indicated on the enclosed project information sheet and distribution list. The enclosed project information sheet includes a State I.D. number; please refer to this number in any future reference to the project.

Pursuant to AS 46.40.094 (d)(1), we have requested consistency review comments on the proposed project from state resource agencies, affected coastal resource districts, the public and any other interested parties. Consistency is determined by reviewing the project against standards of the ACMP and if applicable, policies coastal district management plans. Persons with rights to file a petition seeking review by the Coastal Policy Council of the proposed consistency determination (under AS 46.40.100 (b)(1)) must submit their comments by the appropriate deadline. The comment deadline is specified on the project information sheet.

The State should also review this document in accordance with NEPA and provide comments and suggestions the full range of issues and plans presented. The NEPA regulations (see 1501.1 of 40 CFR) emphasize that cooperative consultation among agencies should occur before preparation of the environmental document, rather than agencies submitting adversary comments on the final document. This consultation should identify environmental effects and values in adequate detail (so they can be compared, per section 1501.2, to economic and technical analysis). The purpose of the enclosed document is to identify the significant issues related to a proposed action. In your response, comments relating to the project's consistency with the ACMP should be identified separately from the NEPA comments.

Thank you for your cooperation in this review process.

**Responses to Department of  
Governmental Coordination**

DGC-1

This information was provided to DGC in a letter from Brad Powell to Jennifer Garland dated 3/19/97

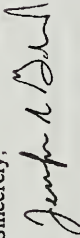
TONY KNOWLES, GOVERNOR

DGC-1



Comments from Department of  
Governmental Coordination

Sincerely,



Jennifer R. Garland  
Project Review Coordinator

Enclosure

cc: Packet Distribution List

Responses to Department of  
Governmental Coordination

Comments from Clover Bay  
Floating Fishing Lodge

**CLOVER BAY FLOATING FISHING LODGE**

P.O. Box 8944  
Ketchikan, Alaska 99901  
USA

Phone (907)247-8353 1-800-354-0137  
Fax (907)247-0724

To 228-6215

Dear Mr. Norm Matson,

Our business, Clover Bay Lodge has been located in the Chomodely Sound area for 13 years. We host from 200 to 300 guests each season who stay with us in this area and operate their skiffs for independent fishing. We get a very large number of repeat guests because of the beauty and wilderness of the Chasina Point, Skin Island area.

There is good fishing and an abundance of both wildlife and marine life in these waters. We are somewhat concerned about the proposed logging as advertised in the Ketchikan Daily News. A Forest Service man called us last year and mentioned the logging proposal and wanted to know what our concerns were. He assured us that all logging in the area would not be visible to anyone fishing this area.

We would like to look at the information packet and see the map to double check. We certainly do need the logging industry for this Ketchikan, Prince of Wales area employment, but you can understand our concern if it will impact our long term tourist fishing business. Could you please send us the information as soon as possible?

CBFFL-1

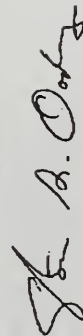
Responses to Clover Bay  
Floating Fishing Lodge

CBFFL-1

Norm Matson met with Angie and Ryan Morin, managers of Clover Bay Floating Fishing Lodge. The Morin's were given a full set of the Chasina Draft EIS. Maps of the alternatives and the Scenic Resources section were reviewed to get an idea of what the harvest units would look like from the ocean. After the meeting, the Morin's did not have any further concerns about the Chasina Project

March 11, 1997

Sincerely,



Stan Oaksmith



## Comments from Mike Sallee

Forest Supervisor  
Ketchikan Area  
Tongass National Forest  
Attn: Chasina EIS  
Federal Building  
Ketchikan, AK 99901

April 8, 1997

Dear Mr. Powell,

Just a couple comments on the Chasina EIS:

Page 10 of the Summary states; "There is no direction or intent to establish a sustainable level of harvest for individual project areas or small geographic subdivisions of the Forest." If each project area requires no intent for a sustainable level of harvest I'm left with the impression that the pool of all project areas combined will ultimately result in an unsustainable level of harvest.

While current and future TLMPs may address this topic, it becomes a daunting task for the lay person to track these kinds of questions down when they're scattered among different layers of regulations, guidelines, practices, and complexity.

Assuming TLMP does mandate enough old-growth retention areas as well as harvestable units in close enough proximity to the current project area to maintain sustainability, another dilemma appears. Basing sustainability on "rate of growth over a period of time" ignores sustainable wood *quality* as well as wildlife habitat, like snags for cavity dwellers, within project areas.

The area between Cholmondeley Sound and Port Johnson/Moira Sound has already been heavily clearcut by Native Corporations. Must the USFS hammer those watersheds even more?

In our bureaucratically neat and organized process of chopping SE Alaska into zones of contention, much of the region as I knew it thirty to forty years ago is becoming radically urbanized. It's little consolation to know other parts of the world are being even more extensively chopped up.

And a note about subsistence: The terms "customary and traditional" evolve so quickly with new technology that they've become meaningless. Fast power boats, aircraft, ATVs, synthetic fish nets, radios, cellular phones, GPS, downriggers, night vision optics, etc. have changed customs and traditions. Thank you.

Sincerely, *Mike Sallee*

Mike Sallee  
PO Box 7603  
Ketchikan, AK 99901

## Responses to Mike Sallee

- MS-1 Long-term sustained yield, by regulation, is calculated for a Forest as a whole.
- MS-2 The harvest of old-growth is expected to continue for another 70-80 years on the Tongass National Forest as there is a gradual shift to harvesting more second growth. Volumes per acre will be greater and wood will be of a more uniform piece size with less defect. Yarding equipment needed to yard second growth is expected to be smaller and less expensive. These factors are expected to improve economics of second growth harvesting. Wood quality studies on second growth management and wood quality are on going at this time. Forest Plan "natural setting" areas and standard and guidelines have taken into account the habitat needs of wildlife species.
- MS-3 Past harvest on National Forest System Lands and other ownership land was taken into account for the selection of harvest units for the Preferred Alternative in the Final EIS. A watershed assessment meeting was held September 18, 1997 with the Interdisciplinary Team members; the Ketchikan Area Planning Staff Officer, Fisheries Biologist, Hydrologist, and the Craig District Ranger, to discuss the issues and concern for the amount of past and proposed harvest in each watershed of the Chasina Project Area. The discussions determined whether the amount of harvest was acceptable in each watershed based on the stream channel types, soils, and topography of the area. Mitigation measures for watershed with past harvest included: deferring units, proposing partial cutting, or leaving wildlife islands (snag patches).
- MS-4 Comment noted.

Comments from Department of Interior  
Fish and Wildlife Service

Responses to Department of Interior  
Fish and Wildlife Service



**United States Department of the Interior**

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
1689 C. Street, Room 119  
ANCHORAGE, ALASKA 99501-5126

ER 97/128

April 23, 1997

Bradley Powell, Forest Supervisor  
Ketchikan Area  
Tongass National Forest  
Federal Building  
Ketchikan, Alaska 99901

Dear Mr. Powell:

In response to your February 28, 1997, request, we have reviewed the Chasina Timber Sale Draft Environmental Impact Statement (EIS). We offer the following and enclosed comments for your consideration.

FWS-1

It is our understanding that the Chasina Timber Sale project will comply with the upcoming version of the Tongass Land Management Plan (TLMP).

We remain concerned about the cumulative effects of this project in combination with other ongoing and proposed timber harvests on Prince of Wales Island and across the Tongass National Forest, particularly in relation to long-term species viability. As a result of a recent court decision, the U.S. Fish and Wildlife Service (FWS) is currently reviewing the status of the Alexander Archipelago wolf and the Queen Charlotte goshawk to determine if they warrant listing under the Endangered Species Act. The U.S. District Court in Washington, D.C., has remanded the FWS's earlier "not warranted" findings for both species. Current project planning is an important consideration in ongoing reviews.

FWS-2

The FWS, Alaska Department of Fish and Game and the U.S. Forest Service (USFS) have been working together to address habitat management concerns for these species. Until the TLMP is revised and the Record of Decision signed, we encourage the USFS to leave management options for these species open.

The Draft EIS states that Habitat Conservation Areas (HCA) would not be implemented in response to Section 502(a) of Public Law 104-19, signed by the President on July 27, 1995. It is our understanding that as of September 30, 1995, this law no longer applies. Since the Draft EIS was published after that date, we believe that implementation of HCAs or old-growth reserves should be considered during planning of the Chasina Timber Sale, as they are being considered for inclusion into the TLMP. We suggest that all references to the Rescission Bill be deleted from the Final EIS.

FWS-3

FWS-1

The Chasina Project is in compliance with the Tongass Land Management Plan (TLMP 1997).

FWS-2

Forest-wide standards and guidelines have been developed in the TLMP (1997) for goshawks and wolves to protect the viability of these species. The Chasina Project is consistent with these standards and guidelines.

FWS-3

Comment noted, all references to the Rescission Bill have been deleted from the Final EIS. Old-Growth reserve areas have been implemented by the TLMP (1997) and the Chasina Project is consistent with those proposals.



Comments from Department of Interior  
Fish and Wildlife Service

Responses to Department of Interior  
Fish and Wildlife Service

FWS-4

We encourage inclusion in all project alternatives of large, medium, and small old-growth reserves and wildlife travel corridors, as defined in the Interagency Viable Population Committee 1993 draft strategy, A Proposed Strategy for Maintaining Well-Distributed Viable Populations of Wildlife Associated with Old-Growth Forests in Southeast Alaska, with the peer reviewed modifications. The old-growth blocks are critical for maintaining viable, well-distributed populations of wildlife across the forest landscape.

If you have questions about the our comments, as described in the enclosure, please contact Nevin Holmberg, U.S. Fish and Wildlife Service, (907) 586-7240. We appreciate the opportunity to provide comments on the Draft EIS.

Sincerely,



Regional Environmental Officer - Alaska

Enclosure

FWS-4 Large, medium and small old-growth reserves have been mapped as part of the TLMF (1997) and are not available for timber harvest.

## Comments from Department of Interior Fish and Wildlife Service

Enclosure  
Department of the Interior Comments on the  
U.S. Forest Service's Chasina Timber Sale  
Draft Environmental Impact Statement (EIS)

### GENERAL COMMENTS

We suggest that the U.S. Forest Service (USFS) review the Purpose and Need section of the Chasina Sale to determine if justification for this project is appropriate, particularly in light of the recent closure of the Ketchikan Pulp Mill (March 1997). Language referencing the 50-year Ketchikan Pulp Corporation (KPC) contract should no longer be applicable, as that contract has expired and the timber to meet the KPC obligated three year sawmill timber supply has been determined in other National Environmental Policy Act (NEPA)-cleared projects. We suggest the current situation be discussed in the Final EIS.

FWS-5

We suggest that the USFS consider reducing the size of the Chasina Timber Sale and making timber available through other programs, such as the Small Business Set-Aside Program or for Sale alternatives. Lower timber volumes would further minimize impacts proposed under all operators to benefit. Operators could yard timber from the existing road system and haul to the Lancaster Cove Log Transfer Facility (LTF), or choose to helicopter yard. This would further reduce impacts associated with the proposed Chasina Timber Sale, and, we believe, should be discussed in the Final EIS.

FWS-6

Several timber sale proposals, including the Chasina Sale, are currently at various stages in the NEPA process. Collectively, these sales are expected to have adverse effects on habitat for the goshawk, wolf, and other old-growth forest associated species by removing old-growth forest and fragmenting large old-growth blocks, which are critical for maintaining viable, well-distributed populations of wildlife across the forest landscape. Given the ongoing, cooperative interagency efforts to gather more information on goshawks and wolves, as well as their habitat requirements throughout the Tongass National Forest, we believe that the Final EIS should state how the proposed timber sale would support those efforts.

FWS-7

We suggest that cumulative impact analysis at the landscape level be conducted for goshawks, marbled murrelets, and wolves to address losses of habitats throughout the Prince of Wales Island area. We further suggest that subsequent NEPA documents for the Chasina Timber Sale and other sales located on Prince of Wales Island show these secondary and cumulative effects on goshawks, wolves and marbled murrelets.

FWS-8

We support and encourage minimizing impacts through reduction of roads, eliminating units in highly erodible and mass wasting areas, and maintaining important old growth habitat for this project area, particularly since very large areas of adjacent non-federal lands have been intensively logged and roaded.

## Responses to Department of Interior Fish and Wildlife Service

FWS-5

There is no mention of the 50-year contract with KPC in the "Purpose and Need" section of the Chasina DEIS. The Purpose and Need of the Chasina Project is to provide wood to the Ketchikan Area timber sale program.

FWS-6

The Chasina Project will be divided into 2-3 economic offerings intended to meet independent timber operator demands. We agree that by reducing the size of the Chasina project there would be fewer environmental impacts, however, more of the project area must be considered than just that which can be accessed by the existing road system. The Final EIS displays the impacts of various alternatives considered.

FWS-7

Same response as FWS-2.

FWS-8

Minimizing impacts will be accomplished by following Forest-wide standards and guidelines. Helicopter logging has been recommended for many harvest units, such as the Alternatives to Clearcutting study units and all of the harvest units in the Port Johnson Peninsula area. Areas of Mass Movement Index 4 soils have been eliminated from potential harvest units. Old-growth reserve areas have been set aside by the TLMP (1997).



## Comments from Department of Interior Fish and Wildlife Service

FWS-9

Remaining old-growth forest blocks in the Chasina Project Area are found on federal lands. These unfragmented old-growth blocks may offer the only remaining refugia for old-growth dependent species.

FWS-10

The 1996 Revised Supplemental Draft EIS for TLMP preferred alternative retains two old-growth forest blocks, Nutkwa LUD II (38,300 ac), which includes a small portion of South Arm of Cholmondeley Sound, and Kitkun Bay (10,400 ac). These areas would be maintained as large and medium old-growth reserves. We recommend that the Final EIS incorporate these reserves.

FWS-11

We have reviewed the USFS Preferred Alternative Old Growth Block strategy, as depicted on the Chasina Project Area Map, and discussed in the Draft EIS. Habitats surrounding the head of South Arm and Kitkun Bay south to Port Johnson Bay provide habitat and migration corridors suitable for old-growth dependent species. We understand the west side of Kitkun Bay old growth block may be extended north to include harvest units 677-311, 319, 327, 328, since these units occur on steep slopes and are economically impractical to harvest (Pers. comm., N. Matson). We suggest that the east side of Kitkun Bay Old-Growth Block also be extended to include Horseshoe Canyon (H59A) watershed. As noted on page 3-19 of the Draft EIS, this watershed is the most hydrologically sensitive in the area and has the highest potential to move materials from headwaters and side slopes into valley bottom fish habitat. This watershed supports spawning and rearing habitat for pink, chum, and coho salmon. Incorporating watershed H59A could further minimize potential impacts to these commercially important resources.

FWS-12

We also suggest that the Final EIS include Cannery Creek drainage and Port Johnson Peninsula as Habitat Conservation Areas (HCA). We believe these areas are necessary to maintain suitable old-growth habitat reserves while providing migration and travel corridors into and out of the project area. The Cannery Creek drainage, for example, may be the only intact watershed remaining in the West Arm of Cholmondeley Sound after federal and private logging and road building activities subside.

FWS-13

As stated in the Draft EIS, in 1995, the U.S. Fish and Wildlife Service (FWS) conducted a status review of the Queen Charlotte goshawk and found that listing the species as endangered pursuant to the Endangered Species Act was 'not warranted,' based in part on insufficient scientific and commercial information. However, the FWS remains highly concerned about the status of the Queen Charlotte goshawk and is currently reviewing the status of this species once more, as directed by court order. Although more information is needed to determine the specific effects of past timber harvest, currently available information suggests that large blocks of old-growth forest are necessary for goshawks. We suggest that a conservative habitat management approach of retaining existing large blocks of mature forest be taken to maintain management options until sufficient information about the habitat requirements of this species is available. We agree with the USFS assessment that the Chasina Timber Sale may have an effect on the Queen Charlotte goshawk.

FWS-14

## Responses to Department of Interior Fish and Wildlife Service

FWS-9

Comment noted, however there are extensive areas of unfragmented old-growth forests adjacent to the project area, such as the Nutkwa LUD II area and the South Prince of Wales Wilderness Area.

FWS-10

This has been accomplished through the TLMP (1997) with some minor changes.

FWS-11

Comment noted, however the Kitkun Bay Old-growth block already meets size and spacing requirements. Forest-wide Standards and Guidelines will help maintain fish habitat in Watershed H59A (harvest Units 679-471, 473, 475 and 507 were deferred from the Final EIS preferred alternative because of watershed concerns).

FWS-12

Comment noted, however current old-growth reserve areas already meet size and spacing requirements.

FWS-13

This has been accomplished with the TLMP (1997).

FWS-14

Comment noted

## Comments from Department of Interior Fish and Wildlife Service

### ALEXANDER ARCHIPELAGO WOLF

In 1995, as stated in the Draft EIS, the FWS conducted a status review of the Alexander Archipelago wolf and found that listing the species as threatened pursuant to the Endangered Species Act was 'not warranted,' based in part on insufficient scientific and commercial information. However, the FWS remains concerned about the direct and indirect impacts to wolf populations occurring on Prince of Wales Island as a result of timber harvesting and is currently reviewing the status of this species once more as directed by court order.

Threats to the wolf are the reduction and long-term degradation of the habitat for the wolf's primary prey species, the Sitka black-tailed deer, resulting from clear cutting, and the development of an extensive road system. Clearcutting has a cumulative impact on deer populations by reducing suitable habitat.

The Draft EIS states as of 1996, wolf habitat capability had declined by 14 percent in the project area since logging began in 1954. The decline is directly related to a reduction in deer habitat capability associated with the conversion of old growth forest to second growth. The gray wolf habitat capability model estimates the Chasina project area can support approximately six wolves (page 3-134).

The Draft EIS indicates that the wildlife models used for project effects analysis are those completed by Suring et al. (1992). We believe the wolf and deer habitat capability models employed in the proposed project effects analysis are not adequate to complete the impact analysis. A new, comprehensive model using appropriate empirical information (i.e., predators, snow accumulation) is being developed to meet the need for adequate analysis. The 1996 Conservation Assessment for the Alexander Archipelago wolf also provides the best available information and management recommendations for this species. We recommend that the USFS utilize these documents as the best available scientific information when developing and implementing the Final EIS and the project plan in relation to those species.

The Draft EIS states there are currently three wolf packs utilizing the Chasina Area. We recommend that the Final EIS address efforts to maintain wolf populations, including maintaining the habitats to support sustainable densities of prey that would support predator populations, minimizing habitat fragmentation and road construction, and developing and implementing monitoring programs. We suggest that winter deer range be identified in the Final EIS and management of this habitat be part of an overall wolf management strategy that ensures wolf viability in the area.

Table WIL-16 (page 3-143) compares the action alternatives with the pre-1954 condition. By 1998, the wolf habitat capability model for Alternative 2 indicates a 21 percent reduction, whereas Alternative 6 indicates that habitat capability would be reduced by 30 percent. Likewise, the deer habitat capability model for the same period indicates a 20 and 29 percent reduction, respectively. State and private land activities were not included in the modeling (page 3-143). Given the

## Responses to Department of Interior Fish and Wildlife Service

FWS-15

The Sitka Deer Habitat Capability Model developed by Suring et al. (1992) did incorporate predator and snow accumulation effects. At the time the Chasina Draft EIS was being analyzed a new deer model had been developed by scientists working on the TLMP. At that time, the new model had some flaws and was of questionable value. It has since been peer reviewed, modified and is now acceptable to use.

FWS-16

This document has been reviewed and recommendations taken into consideration. This document identifies management actions that address risks to wolf populations such as: modifying hunting and trapping regulations, limiting construction of new road, effectively closing some existing roads, and modifying timber harvest strategies to minimize fragmentation and loss of critical deer winter range. It recommends habitat to support a minimum density of 13 deer per square mile which would provide current levels of deer harvest by hunters, trappers and wolves. Deer habitat capability remaining in the Chasina Project area after implementation of the preferred alternative is greater than 25 deer per square mile.

FWS-17

Same response to this as FWS Comment #8

FWS-18

Winter deer habitat will be address in the Final EIS.

FWS-19

The analysis of habitat capability for the Chasina Project assumed the worst case scenario of no habitat capability on State and other ownership. The habitat capability of National Forest Systems Lands appears to be adequate to meet the needs of wolves, subsistence and sport hunters. This is probably the correct method to analysis demand because private lands are not legally available for hunting by the public.



## Comments from Department of Interior Fish and Wildlife Service

inadequacy of the wolf and deer models used for Chasina project impact analysis, these habitat capability reduction estimates could be grossly underestimated. We suggest that the Final EIS include a reassessment of the direct, indirect, secondary, and cumulative impacts associated with this project, including adjacent private and State land activities, and using the most current information.

According to the Draft EIS, to harvest all available units within the Chasina Project area, a total of 191 miles of road would be needed. Currently, the total project area has about 56 road miles, of which 21 miles occur on National Forest lands. The Draft EIS states (page 3-179) road density is currently about 1.6 mi/mi<sup>2</sup> across the area when including Native and State lands, and 0.32 mi/mi<sup>2</sup> when considering only National Forest lands.

Alternative 2 represents the least amount of new road construction, adding about 12 new road miles, whereas Alternative 6 would add approximately 63 new miles. However, when total project road miles (adding open and closed, private, State, and federal lands) are included, the proposed project road miles range from 68 (Alternative 2) to 119 (Alternative 6). Therefore, open and closed road densities are expected to range from 0.93 mi/mi<sup>2</sup> to 1.75 mi/mi<sup>2</sup>.

The Draft EIS states that the effects of increased road density would be substantially mitigated by access management and the fact that roads in the project area are not connected to any human population centers. However, we believe that road closure methods in the Tongass National Forest have not always successfully precluded continued illegal use, particularly by off-road vehicles and shoreline access was not taken into account as the Interagency Viable Population Committee (VPOP) recommended (Suring et al. 1993). Boats carrying ATVs could take advantage of the Chasina road system, thus increasing legal and illegal harvesting pressures on deer and wolves. We suggest that shoreline access be taken into consideration when conducting impact analysis in the Final EIS.

Open and illegally used roads and shoreline facilitate human access, increasing hunting opportunities that may adversely affect local wolf populations. Person et al.<sup>1</sup> determined that wolf mortality was correlated with linear miles of roads and that wolf harvest increased twofold when the length of road below 1200 feet elevation exceeded 0.7 linear miles per square mile. We suggest that, considering the current elevated road density, all new roads remain closed to the public and "put to bed" after completion of the project. We also suggest that density of roads potentially subject to illegal use be determined for the project area and request to be involved in the development of the road access management plan for the Chasina sale area.

Furthermore, we suggest that the Final EIS include an impact analysis of total project area road miles (existing and proposed, federal, State, and Native) versus only those on National Forest lands. We agree with the USFS assessment that: 1) implementing any of the Chasina Project action alternatives would result in a reduction in deer habitat; 2) that road densities would increase as a result of implementing any of the alternatives; and 3) that implementing the Chasina Timber Sale may affect the Alexander Archipelago wolf.

FWS-20

FWS-21

FWS-22

## Responses to Department of Interior Fish and Wildlife Service

FWS-20

The road density figure of 1.6 mi./sq. mi. is based on a 1995 ADF&G report from K. Hanley and J. Durst, that shows WAA 1211 contains 142 miles of roads on non-National Forest System Lands. The addition of 22 miles of roads on National Forest System Lands totals 164 miles of road on 102 square miles of land for a density of 1.6 miles of road per square mile (164 divide by 102 = 1.608). The road density for only National Forest System Lands was based on 22 miles of road on 67.7 square miles of land for a density of .32 miles of road per square mile (22 divided by 67.7 = .3249). FWS calculations of density included miles of road on other ownership land, but not the amount of land in other ownership.

FWS-21

Increased access to the area due to road construction is indeed a concern. The possible increase of non-motorized and/or all-terrain vehicle use is acknowledged. The effects of roading on wildlife is covered in the EIS in the Wildlife Section under Cumulative Effects-Road Density analysis. Open road densities were considered when developing the road management objectives for all roads in the project area. Road building is minimized to the extent possible. The roads in the project area are not connected to any other major road system and are not expected to receive a large increase in the number of hunters.

FWS-22

The interdisciplinary team considered present and future needs of the existing and proposed road system. Impacts to wildlife and fisheries were considered if roads were to be left open. The Access Management Plan developed for the Chasina Project was discussed with representatives from USFWS and Alaska State DEC/DF&G/DGC in a joint meeting November 19, 1997.



## Comments from Department of Interior Fish and Wildlife Service

### MARBLED MURRELET

A murrelet ground nest was discovered on south Prince of Wales during 1993. The Draft EIS stated that during Chasina Timber Sale field reconnaissance in 1995, murrelet eggshell fragments were found at two locations, near Paul Lake and Lancaster Cove and that there have been concentrations of murrelets in Dora Bay, Lancaster, and Kitkun Bay.

Research conducted in the murrelet's Pacific Northwest range suggests that sufficient indicators exist to demonstrate a cause and effect relationship between loss of mature forest and reduced murrelet populations. We agree with the USFS assessment that, based on current information, a reduction in nesting habitat as a result of the proposed project action may affect marbled murrelets in the Prince of Wales Island area.

We suggest that a landscape management plan be developed and discussed in the Final EIS, including monitoring and retention of large tracts of mature, old-growth forest with suitable branch structure to support murrelet nests.

We also suggest that, in the Final EIS, secondary and cumulative impacts of this sale on murrelets in the project area be evaluated thoroughly and that preliminary marbled murrelet pre-breeding flight counts and intensive inventory surveys during breeding season (May 15 through August 15) be conducted. Count and survey results should be included in the interagency database and the Final EIS. In addition, we suggest that project-wide murrelet habitat studies be conducted.

### OLD GROWTH RETENTION/TRAVEL CORRIDORS

We support establishing linkages between old-growth forest habitats to aid in species dispersal. However, we believe travel corridors associated with roads, clear cuts, second growth and utility corridors are not suitable for this purpose.

We suggest units located on the west side of South Arm, north of Kootznooowoo Native Corporation lands, be deferred at this time. This includes all of VCU 674 and those units in VCU 678. Because of extensive logging on adjacent private lands, we suggest this area be retained as an old-growth reserve to enhance old growth connectivity with Nukwa (southwest), Polk Inlet (west) and the South Prince of Wales Wilderness Area (south).

We support an old-growth reserve at the head of Kitkun Bay over to North Arm of Moria Sound. This old-growth block represents an important wildlife haven and important travel corridor, considering the surrounding private lands have sustained such intense habitat loss.

The Draft EIS Figure OG-1, Important Old-growth Blocks and Corridors, and the Landscape Zones Map, identify travel corridors within the project area. However, large portions of these corridors occurring off Tongass National Forest lands do not exist. In order to maintain travel corridors to ensure wildlife dispersal, we suggest that breaks in the corridor from harvesting

## Responses to Department of Interior Fish and Wildlife Service

FWS-23

Comment noted.

FWS-24

This landscape management plan has been completed by the TLMP (1997).

FWS-25

Given that marbled murrelets are highly mobile, traveling up to 50-60 miles per day on foraging flights, intensive surveys on a small project area may not provide useful information. Project effects were assumed to be proportional to the amount of old-growth forest harvested. Analysis completed for the TLMP (1997) concluded that "short term (10-15 years) risks to murrelet viability are difficult to assess but are likely minor especially given the magnitude of recent conservative population estimates of over 365,000 marbled murrelets in southeast Alaska".

FWS-26

Comment noted.

FWS-27

Comment noted, however it is anticipated that the 1,000 foot beach fringe, stream buffers and other old-growth set-asides will maintain connectivity between these areas as much as possible given what is happening on other ownership.

FWS-28

Comment noted.

FWS-29

Primary travel corridors in the Chasina Project area are the the beach fringe which has been protected by a 1,000 foot beach fringe buffer where commercial timber harvest is not allowed. No harvest is proposed in the 1,000 foot beach fringe by any of the Chasina Final EIS alternatives. The Forest Service has no control over what happens to the beach fringe areas on other ownership.



## Comments from Department of Interior Fish and Wildlife Service

timber units not be allowed to exceed 65 feet, as stated in the VPOP Committee's 1993 report, unless another corridor route can be established or the old-growth reserve increased to aid in dispersal. We suggest that the Final EIS discuss how the VPOP recommendations for wildlife dispersal would be implemented in areas that have breaks greater than 65 feet or where no corridors exist at all. We suggest that the Final EIS include a map that clearly depicts current conditions.

### MITIGATION

We suggest the Final EIS clarify mitigation efforts, where they are separate from compliance requirements established by law. The Draft EIS (page 2-35) treats provisions such as stream buffers as mitigation measures, when in fact, they are required by the Tongass Timber Reform Act (TTRA). Best Management Practices (BMP) under the Clean Water Act, TTRA, National Forest Management Act (NFMA), and so on, are requirements that must be adhered to on all Tongass National Forest timber sales. Mitigative actions are those activities that occur after statutory requirements are achieved. Restoring a site to its original condition after harvest, such as road base removal, or re-establishing woody vegetation around water bodies impacted by previous harvest activities, are examples of mitigation activities. If Chasina Sale buffers exceed TTRA requirements, we suggest the Final EIS clarify this and quantify additional riparian areas protected.

We suggest that the Final EIS describe what long-term restoration activities are planned in the Chasina project area to adequately restore sites previously impacted by past and proposed timber harvesting, or to improve aquatic and terrestrial habitats affected by associated forest management activities.

### WETLANDS

Timber harvesting within wetlands affects hydrology of sites on a long-term basis. As the canopy layer is removed by clearcutting, water levels retained in the soil decrease as a result of wind and sun. Surface sheetflow increases, causing increases in flash flood events and runoff. As second growth woody vegetation returns, generally more stems per acre are generated, causing an increase in water up-take through the young tree root systems. It is common for wetlands to become drier than they previously were, and intermittent stream or muskeg water levels to drop. Since the growing season is rather short in Southeast Alaska, this additional stress on vegetation may cause stunting in growth or limit regeneration capabilities. These hydrological changes can have a long-term impact on a wetland system and in some cases, may take years to stabilize and reach an equilibrium.

Degradation of wetlands caused by heavy equipment impacting vegetation results in impairment of natural drainage patterns, loss of nesting and foraging habitat for migratory birds and small mammals, and displacement or mortality of game species, including black-tailed deer, black bear, and wolf. We are concerned that such habitat alteration can result in permanent hydrologic

## Responses to Department of Interior Fish and Wildlife Service

FWS-30 Wording has been changed for the Final EIS.

FWS-31 Table AQU-17 displays the stream buffers required by the TLMP (1997).

FWS-32 If and when post timber sale monitoring determines habitat degradation, a restoration plan addressing impacted resources will be developed and implemented. At this time there is no long term restoration planned, however culvert removal and road obliteration could restore some terrestrial habitat and could help reduce the amount of sedimentation into streams from road surface erosion.

FWS-33 Secondary impacts from roads and landings, and procedures to minimize impacts, are discussed in the last three paragraphs of the "Effects Of Road Construction on Wetlands" portion of the Wetlands section of the EIS. Cumulative impacts are discussed in the "Cumulative Effects" portion of the Wetland section. The "Mitigation Measures" portion of the Wetlands section discusses procedures to avoid and minimize long and short-term adverse impacts.



## Comments from Department of Interior

### Fish and Wildlife Service

change, and, in some cases, loss of functional wetlands. We suggest that the Final EIS address Chasina Timber Sale's secondary and cumulative impacts on wetlands and how the goals of Executive Order 11990, as amended, would be met to avoid to the extent possible the long- and short-term adverse impacts associated with destruction or modification of wetlands.

During road construction some excavation of wetland overburden is usually required. We suggest that the direct and cumulative impacts associated with disposal of this material be discussed in the Final EIS. Total cubic yards removed and location for its disposal should also be described in the Final EIS.

FWS-34

We suggest that the Final EIS wetland and road assessments discuss what alternatives were evaluated for the disposal of overburden material. The assessment should discuss the unsuitability of wetlands and riparian sites for overburden disposal. In addition, we believe the assessment should discuss the potential for containing the overburden behind a dike or berm in an upland area. Rehabilitation plans for impacted wetlands and overburden disposal sites should also be discussed, we suggest, in the Final EIS.

#### FISHERIES

The Draft EIS states that application of BMPs and adherence to TTRA requirements would protect water quality, fish habitat, and wetlands. A recent report to Congress, (Anadromous Fish Habitat Assessment (AFHA), January 1995) concluded that the BMPs currently employed across the Tongass National Forest were inconsistently applied and failed to adequately protect fish habitat. The report recommended a more conservative management approach to protect fish habitat. We believe that the Final EIS needs to include the recommendations contained in AFHA, or acknowledge the shortcomings of BMPs in its effects analysis.

FWS-35

Secondary impacts associated with road maintenance, such as road grading, include soils and fines being deposited in ditches, wetlands, and indirectly into streams. Over time, changes in stream depth or water flow can affect fish habitat. We do not agree that application of BMPs and TTRA are adequate to protect water quality and fish habitats. We suggest that the Final EIS identify methods of monitoring be used to ensure compliance with NFMA and TTRA, frequency of inspections, percentage of unit inspected, and cumulative analysis of past and current fish habitat losses within the sale area. We further suggest that the Final EIS analyze secondary and cumulative impacts to fisheries and streams occurring throughout the project area, including streams that cross both Tongass National Forest and private lands.

FWS-36

Current funding and staff limitations may severely affect the USFS ability to carry out the monitoring program. We suggest that these limitations on monitoring be addressed in the Final EIS.

The USFS efforts to minimize impacts to fish habitat would hopefully result in long-term maintenance of healthy fish populations. We believe that the monitoring plan should include

## Responses to Department of Interior

### Fish and Wildlife Service

FWS-34

Road construction and excavation of wetlands is avoided whenever practical. Road construction on wetlands usually utilizes an overlay type of road construction without excavation, using non-merchantable woody debris as a mat for the road. Whenever small amounts of wetland require excavation, the material is incorporated into the road prism with the woody debris and capped with borrow excavation. Disposal of overburden and endhaul material is addressed on the road cards for each road and will indicate that disposal will be on upland areas with rehabilitation requirements for those disposal sites.

FWS-35

The issues addressed in the Anadromous Fish Habitat Assessment Report have been addressed in the TLMP 1997. The Chasina Project has implemented those recommendations and new standards and guidelines by:

- 1) During field reconnaissance, areas with steep slopes, high hazard soils, and high density of Class III and IV streams were identified and evaluated for risk of adverse impacts on headwater stream channels. BMP's listed on the individual unit and road cards were prescribed to reduce the on-site erosion and delivery of sediment to a stream channel.
- 2) Site-specific stream-side buffers are provided for floodplain and confined alluvial channels. Harvest units adjacent to Class I and II stream channels were investigated by project fisheries biologists to determine the extent and type of buffer necessary to assure protection of any small, off-channel streams associated with floodplains and to provide a long term source of woody debris.
- 3) A watershed analysis was conducted which included a sediment delivery risk analysis that identified high risk watersheds. Harvest units were prioritize and high priority units were visited on the ground to identify and protect streams, soils, wildlife, karst and other concerns. Areas not meeting forest standards and guidelines were deleted and stream buffers were prescribed to protect streams and the Riparian Management Area.
- 4) Fish habitats and communities were inventoried and characterized with stream surveys and snorkel counts in all the major fish used for project-level planning.

FWS-36

Monitoring methods used to insure compliance with NEPA and TTRA, frequency of inspections, percentage of units inspected, and cumulative analysis of past and current fish habitat losses within a sale area have been addressed in the TLMP 1997.



## Comments from Department of Interior Fish and Wildlife Service

remedial actions that would be initiated and implemented when adverse impacts are discovered. We suggest that some index of health be developed for anadromous and resident fish streams potentially impacted by this project. Escapement monitoring or smolt yield would be useful indices for high value fish streams, if feasible. We suggest these issues be discussed in the Final EIS.

FWS-37

The Draft EIS identifies historic and potential future fish habitat degradation within the project area caused by past and proposed logging, respectively. We suggest that the Final EIS address in more detail measures that would be taken to restore Chasina project area water bodies, to improve water quality, to improve fish habitat and to reduce or eliminate the sedimentation problems that persist from previous and proposed timber harvesting/road building activities.

FWS-38

Additionally, we suggest that the Final EIS summarize fishery effects in light of current habitat degradation, secondary and cumulative effects of past and proposed harvest activities, and the known limitations of BMPs.

FWS-39

### LOG TRANSFER FACILITIES

The Draft EIS describes some of the impacts that can be expected from operation of an LTF. However, the discussion minimizes and, we believe, underestimates the potential impact on marine and estuarine resources, and should be further elaborated in the Final EIS. Water disperses sediments, pollutants and associated impacts over a much broader area than the actual site of any discharge. A LTF would result in significant amounts of woodwaste and other non-point source pollutants, such as petroleum products, construction and operationally induced turbidity and siltation, and organic leachates from upland and in-water woodwaste.

FWS-40

Operational activities at logging camps and LTF sites would cause some species of migratory birds and other wildlife to avoid these high value estuarine and marine habitat areas. Turbidity and pollutants can adversely affect salmon fry which rear in, and migrate through these protected nearshore areas. Other planktonic, demersal, and benthic marine organisms would also be adversely affected. Productive kelp and eelgrass beds can be degraded or eliminated in the vicinity of a LTF.

The Prince of Wales Island Area Plan identifies the West Arm of Cholmondeley Sound as important habitat for fish and wildlife resources. The area supports intensive commercial shrimp, salmon, and crab harvest, while providing community and sport recreational opportunities. Operation of a LTF in this area could severely affect these important commercial, community, and sport fisheries resources. Additionally, Cholmondeley Sound provides wintering, nesting and molting areas for waterfowl and shorebirds. The LTF associated activities could further stress these species during critical periods of their life cycle.

The North Arm of Moria Sound is also designated in the Prince of Wales Area Plan as prime marine habitat with intensive commercial harvest. A LTF in this area could produce a wider zone

## Responses to Department of Interior Fish and Wildlife Service

To develop an index of health for anadromous and resident fish streams potentially impacted by this project we have conducted spring and fall escapement counts on major fish producing streams in the Project Area during the field recon portion of the project. We will continue to conduct escapement counts into the future. This will be in addition to the TLMP Monitoring and Evaluation Plan.

FWS-37

Same response as to Comment #32.

FWS-38

The long term effects of logging and road building on fisheries cannot be clearly known. Professional judgement based on our understanding of how watersheds function, stream channel processes and fish habitat are affected by these activities were used to develop the sound fish and riparian protection measures outlined in the TLMP. The Tongass Forest Plan Chapter 3 discussion of fish environmental consequences presented conclusions drawn by the Riparian Fish Panel. The Panel said that short term impacts (less than 10 years) may occur but the likelihood of negative impacts is related to the probability of a major storm event occurring and triggering increases in sediment movement. Even if a major storm event occurs there is a time lag before impacts to salmon populations can be measured due to the life history of most salmonids which includes up to several years maturing in the ocean. The risk of significant negative impacts to fish due to earth disturbing management activities increases in the long-term largely because of the increased likelihood of a major storm event occurring. Additionally, though time, as the miles of road and the percent of the watershed in young age class forest increases, so does the chances that negative impacts to fish may occur.

FWS-39

All new and existing LTF's will comply with the Alaska Timber Task Force (ATTF) guidelines established in 1985. All new and existing LTF's will also meet the National Pollution Discharge Elimination System (NPDES) standards for permitting the discharge and drainage of stormwater.

FWS-40

of deposit for woody debris since the site is exposed to southeast storms. Woody debris could ultimately accumulate at the head of North Arm, an extremely important salmon holding area.

The Chasina Draft EIS states the Lancaster Cove LTF would be maintained as a barge loading facility. We support this lower impact alternative location. Direct land-to-barge transfer of logs would avoid and minimize direct, secondary, and cumulative impacts of bark accumulation, shading, and compaction associated with LTFs and log storage. We suggest these LTF issues be further elaborated in the Final EIS.

ROADS

We suggest that the Final EIS provide a map showing the location of all proposed or existing borrow and gravel mining sites and include a plan for their rehabilitation.

FWS-41

We encourage the USFS to utilize helicopter yarding as an alternative harvest method to reduce the need for additional roads in the Chasina project area, and to discuss this option more fully in the Final EIS. Timber units in this proposed sale are sufficiently close to marine waters where helicopter yarding could easily be accomplished, thus minimizing short- and long-term impacts to off- and onshore habitats. Helicopter yarding reduces impacts caused by road construction, such as sediment loading of streams and road related landslides. Helicopter yarding would prevent impacts to karst landscapes, estuaries, wetlands, and other habitat types. This method also reduces the amount of old-growth timber permanently removed by clearing rights-of-way.

FWS-42

FIELD INVENTORIES

We believe that the Final EIS should more adequately address how many fish stream and wildlife surveys have been completed within the proposed sale area. The Final EIS should provide, we suggest, a summary of survey methodologies employed, the units covered, the frequency, and time of year that surveys were performed. We also suggest that the Final EIS include a map that identifies the location of all pedestrian transects, trap grids, herpetology arrays, or other sampling plots used to determine the on-site status of species.

FWS-43

MAPS

The Draft EIS maps are hard to read and lack sufficient detail. We suggest that bolder, broader lines would improve the readability of the maps. Details provided on Alternative Maps, such as individual units, are too small and overlapped to be easily understood. We suggest that a legible map showing the total unit pool for the Chasina Sale should be provided in the Final EIS. We also believe it would be helpful to include adjacent communities, use patterns that cross Tongass National Forest boundaries, land status, and so on, occurring adjacent to the sale area on the overall Project Area Map. This would allow the reviewer an opportunity to evaluate travel and migration corridors, connectivity on- and off-site, potential adjacent land use impacts, and proximity to important habitats, reserves, and so on.

FWS-44

FWS-41

Proposed rock sources for use on the project are displayed on the road cards. All rock sources developed are required to have a rehabilitation plan prior to release of the source for development. Final acceptance of the road construction requires the rock pit rehabilitation to be completed.

FWS-42

A discussion of helicopter logging was in Chapter 3, page 249 of the Draft EIS and on page ?XXXX? of the Final EIS. This project has strived to helicopter areas where it was economically and environmentally practical, such as helicopter logging all units in the Port Johnson peninsula area and the "Alternatives to Clearcutting" units.

FWS-43

Surveys conducted for fish and wildlife species are discussed in the Fisheries and Wildlife Specialist's Reports for the Chasina Project. These documents are part of the planning record and are available on request from the Craig Ranger District. This level of detail would not be appropriate for inclusion in an EIS. However, for example, during the 1995 and 1996 field seasons 68 and 66 harvest units respectively were surveyed for goshawks.

FWS-44

Comment noted. For areas of concern outside of the Project boundary, please refer to the TLMP 1997 map packet.



## Comments from Department of Interior Fish and Wildlife Service

## Responses to Department of Interior Fish and Wildlife Service

### **SPECIFIC COMMENTS**

|        |   |        |   |
|--------|---|--------|---|
| FWS-45 | Chapter 3, page 1: We believe that this section on Analyzing Effects should include Secondary Effects.  | FWS-45 | Comment noted.  |
| FWS-46 | Chapter 3, page 2, paragraph 2: We suggest that this section include an explanation of why the time frame analysis is until the end of the KPC long-term contract (year 2004). The current status of the long-term contract and how that would affect this and future timber sales needs to be clarified. | FWS-46 | Reference to KPC contract has been deleted in the Final EIS, however the time frame of 2004 is still appropriate since it represents approximately a 10 year time period from the start of the project in 1994.   |
| FWS-47 | Chapter 3, page 17: We believe that watershed E38A should be included on the Figure AQU-1 map.  | FWS-47 | This watershed has been added to Figure AQU-1, however no federal timber harvest activity is planned within this watershed.   |
| FWS-48 | Chapter 3, page 45, Table FP-2: VCU 674 under Alt. 6... "66 acres" should read "6.6."   | FWS-48 | Yes, thank you.   |
| FWS-49 | Chapter 3, page 50: 1: No commercial harvest...applied to "either" side....should be changed to read...applied to "both" sides.   | FWS-49 | Yes.  |
| FWS-50 | Chapter 3, page 70: This section states that the rock overlay is "highly" permeable. We suggest that literature citations that support this statement be added.   | FWS-50 | A source has been cited, Harza, 1995.   |
| FWS-51 | Chapter 3, page 71: We suggest that the term "critical wetland" needs a clear definition.   | FWS-51 | Language has been changed and corrected.  |
| FWS-52 | Chapter 3, page 151, Figure OG-1: This map showing travel corridors should be improved, we suggest, by using the most current, accurate information available.  | FWS-52 | This map has been improved.   |
| FWS-53 | Chapter 3, page 162: This section makes reference to TLM 96 large old-growth blocks. We suggest that the section should identify the most recent versions of large blocks on a map, with clear delineation of boundaries.   | FWS-53 | The most recent Old-Growth Reserve strategy incorporated by the TLM is displayed on Figure OG-1.  |
| FWS-54 | Chapter 3, page 162: This discussion states that South Arm Block was logged about 20 years ago. We suggest adding a discussion of the volume of timber that was removed and how logs were removed and transported from the area (e.g., LTF, barge).   | FWS-54 | At the southern end of South Arm, approximately 500 acres of probably high volume timber was A-framed logged off the beach. No roads were constructed other than bulldozer created skid trails. The logs were probably removed from the area in small rafts.  |
| FWS-55 | Chapter 3, page 178: We believe that an explanation of why shoreline access and adjacent land use activities were not included in wolf/deer habitat capability models would be helpful in this section.   | FWS-55 | The EIS assumed the "worst", in that the habitat capability from non-National Forest System lands was assumed to be 0 (even if the land has been harvested there is some habitat capability). We then analyzed if habitat capability on National Forest System lands could meet the total demands of the area, including other ownership (which is appropriate since native corporation land is private land and not open to the public). Shoreline access is not a component of either the wolf or deer habitat capability models. |

Comments from Alaska Department of  
Fish and Game

Responses to Alaska Department of  
Fish and Game

STATE OF ALASKA

**DEPARTMENT OF FISH AND GAME**

DIVISION OF HABITAT  
& RESTORATION

TONY KNOWLES, GOVERNOR

P.O. BOX 271  
KALAMOOK, ALASKA 99825-0271  
PHONE: (907) 755-2485  
FAX: (907) 755-2440

April 24, 1997

Mr. Bradley E. Powell, Forest Supervisor  
Ketchikan Area  
Tongass National Forest  
Attn: Chasina EIS  
Federal Building  
Ketchikan, AK 99901

Dear Mr. Powell:

Re: Chasina Timber Sale Draft Environmental Impact Statement  
NEPA Comments

The Alaska Department of Fish and Game (ADF&G) appreciates this opportunity to provide comments to the USDA Forest Service (FS) on the Draft Environmental Impact Statement (DEIS) for the proposed Chasina Timber Sale on the Craig Ranger District.

An interagency meeting concerning the Chasina DEIS was held in Juneau on April 15, 1997, attended by representatives of the FS, the ADF&G, the Division of Governmental Coordination, and the Alaska Department of Environmental Conservation. At that time, Dave Arrasmith and Norm Matson of the FS indicated that the deadline for comments under the Alaska Coastal Management Program (ACMP) would be extended to allow for additional information to be distributed to the agencies and discussed among state and FS staff, although we have not yet received written confirmation of the extension. We look forward to the additional information, and hope that fruitful discussions will ensue.

At this time, the ADF&G is submitting brief comments under NEPA only. Time constraints and a lack of complete resource and project information have limited our comments to one issue, that of the old growth reserves proposed for the project area. The following specific comments are based on material provided by the ADF&G Division of Wildlife Conservation. More complete comments under the ACMP, along with ANILCA subsistence comments, will be submitted by the extended deadline.



## Comments from Alaska Department of Fish and Game

Mr. Bradley E. Powell  
April 24, 1997

Chasina Timber Sales DEIS  
NEPA Comments

### NEPA COMMENTS

Small old growth reserves were not included in the DEIS, although the ADF&G was able to see a map of them at the April 15, 1997, meeting with Norm Matson and Dave Arrasmith in Juneau. Mr. Matson also provided a list of acres by timber volume class within the old growth reserves in the project area.

The reserves were located by the FS without consultation with the ADF&G. At the April 15 meeting, the FS agreed to provide the ADF&G with criteria and information that were used in old growth reserve selection and why those areas were selected over others. In essence, the ADF&G requested the reasoning for why the old growth reserves are where they are. Although the mapped retention areas may very well be in optimal locations for a successful viable populations strategy, we cannot support putting wildlife retention in these places without more information on the composition of the blocks, their habitat quality, and the rationale for their selection over other forest blocks in the study area.

Some old growth reserves raise particular concerns. The Chasina Point reserve seems to have fewer acres and a smaller composition of productive forest than guidelines recommend for reserves. The Kitkun Bay medium reserve also seems to have fewer acres than the guidelines recommend. We were told that a small reserve was added to the northwest of the medium reserve at Kitkun but it is unclear if the acres information we received for the medium reserve includes the small reserve acres. Also, it appears a portion of the large reserve linking the southwest shore of South Arm Cholmondeley Sound with the Nutkwa LUD II and the South Prince of Wales Wilderness was deleted. In its stead, a small reserve was put on the southeast shore of South Arm.

We are under the impression that the FS has made commitments to the U.S. Fish and Wildlife Service and to the State as part of the TLMP revision process to review small old growth reserves as timber sales are analyzed. The reviews would allow for an adjustment in old growth reserve boundaries through the NEPA process to improve their function as habitat reserves, better ensuring viable wildlife populations. ADF&G and the Fish and Wildlife Service have already expressed a desire to review small reserve locations for the Crystal Creek and Canal-Hoya timber sales in the Stikine Area. We would like to reiterate our desire to meet with the FS and discuss the opportunities to conduct this type of review and analysis of the Chasina Timber Sale area before options are foreclosed by the project's ongoing planning.

In a project area already as fragmented as Chasina, the location of habitat reserves is critical to the persistence of healthy wildlife populations, particularly if more fragmentation is planned. We look forward to receiving information on the rationale for the location of the reserves and urge that there be an interagency discussion of all the options remaining for them.

Thank you for the opportunity to provide NEPA comments on the Chasina Timber Sale Draft Environmental Impact Statement. If you have questions, or need additional information, please contact me.

## Responses to Alaska Department of Fish and Game

|         |   |
|---------|---|
| ADF&G-1 | An information package was provided to ADF&G on April 21, 1997 that provided the justification for the location of all old-growth reserve blocks in the Chasina project area.   |
| ADF&G-2 | While the Chasina Point small old-growth reserve area was short of the recommendation for productive old growth, it was the best habitat available in VCU 680 that met spacing requirements.  |
| ADF&G-3 | The acreage in question was only for the portion of the Kitkun Bay Reserve that was in the Chasina project area. The total reserve is approximately 11,800 acres which exceeds the recommended size of 10,000 acres.  |
| ADF&G-4 | That is correct, those changes took place as part of the TLMP Final Revision.   |
| ADF&G-5 | The Forest Service met with ADF&G and the U.S. Fish and Wildlife Service November 19, 1997 in Ketchikan finalize the old-growth reserve areas. The small old-growth reserve at Chasina Point was enlarged by including commercial forest in the adjacent VCU to the west (VCU 679). |

Comments from Alaska Department of  
Fish and Game

Mr. Bradley E. Powell  
April 24, 1997

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Chasina Timber Sales DEIS  
NEPA Comments

Sincerely,



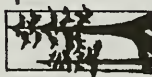
James D. Durst  
Area Habitat Biologist  
Prince of Wales Area

cc: Lana Shea Flanders, ADF&G H&R, Douglas  
Tom Paul, ADF&G WC, Douglas  
Bob Schroeder, ADF&G SUBS, Douglas  
Kevin Hanley, DEC, Juneau  
Jennifer Garland, DGC, Juneau  
Jim McAllister, DNR, Juneau  
Norm Matson, FS, Ketchikan  
Dale Kanen, FS, Craig  
Vicki Davis, FWS, Ketchikan

Responses to Alaska Department of  
Fish and Game



## Comments from Tongass Conservation Society



### **Tongass Conservation Society**

**PO Box 23377 Ketchikan, AK 99901 (907)225-5827**

April 25, 1997

Ketchikan Area Forest Supervisor  
Federal Bld.  
Ketchikan, AK 99901  
Att: Chasina DEIS

The following are comments submitted by Southeast Alaska Conservation Council and Tongass Conservation Society. SEACC is a coalition of 15 volunteer citizen organizations in 12 Southeast Alaskan Communities. SEACC's membership includes commercial fishermen, Alaska Natives, small timber operators and value added wood manufacturers, tourism and recreation business owners, hunters and guides and Alaskans from many other walks of life. Tongass Conservation Society is SEACC's Ketchikan based member group with approximately 150 members.

Both organizations are dedicated to preserving the integrity of Southeast Alaska's unsurpassed natural environment while providing for the balanced, sustainable use of our region's resources. Southeast Alaska contains magnificent old-growth forests, outstanding fish and wildlife habitat, important customary and traditional or subsistence use areas, excellent air and water quality, unsurpassed recreational opportunities, world class scenery, and a landscape that allows for hardy, independent people to lead a lifestyle long forgotten in much of America.

#### Introduction:

We are presently in the throes of sweeping change in the Southeast Alaskan timber industry. One month ago, Louisiana Pacific's Ketchikan Pulp Mill closed its doors for good, marking the end of the old Tongass timber industry. In addition, Ketchikan Pulp's long-term timber contract, which has long driven the timber sale program and led to unsustainable logging on Prince of Wales Island, no longer exists. A modification of the contract guarantees LP three years supply of wood to run their sawmills in Metlakatla and Ketchikan. But none of the wood promised to LP is slated to come from the Chasina sale or the Lab Bay Sale, which SEACC appealed. Despite the undeniable fact that the days of large scale timber operations, consisting of extensive road building and clearcutting are over, the Forest Service has, with the 50 million board foot Chasina timber sale, moved forward on another project strikingly similar to the old way of doing business.

To commence with this sale a few short months before the completion of the new Tongass Land Management Plan is irresponsible and shortsighted. The Forest Service may also be passing up and excellent opportunity to lay the foundation for a new, Prince of

## Responses to Tongass Conservation Society

TCS-1

The TLMP Revision process turned into more than a ten-year process which made it impossible to predict the timing of a final decision and impracticable to stop the NEPA and timber sale process to wait for a decision. The timber sale process may take 2-6 years dependent on many factors. An effort was made to predict what the new standards and guidelines would be in the TLMP, such as the 500 foot beach fringe. TLMP standards and guidelines have been incorporated into the Final EIS such as 1,000 beach fringe and the most recent Old-Growth Reserve Areas.

The Forest Service has made an effort to encourage options to the traditional timber industry by holding workshops on Prince of Wales Island addressing value added products, kilns, grant writing, and special forest products. The Chasina EIS will make possible several small sales (see Appendix A). The project area will be divided into about 3 offering. These will be designed for smaller operators and offered through the open bidding process.

TCS-1

TCS-2

Because the ASQ was lowered in the new Tongass Land Management Plan, the Ketchikan Area will be adjusting its sale offerings accordingly. The results are that offerings from the Chasina project will be offered in several sales over several years rather than all in one year (see the new revised Appendix A in the Final EIS). As stated in TLMP (1997), "one of our objectives is to manage the Forest to promote community stability in an environmentally sound manner". Providing a mix of goods and services that maximize net public benefit is the goal. TTRA, section 101, provides for seeking to provide a supply of timber from the Forest which meets annual market demand. The TLMP Final EIS addressed the closure of the KPC pulp mill, however, trying to predict regional timber supply and demand are outside the scope of project level analysis.

TCS-1  
(cont.)

Wales Island based, sustainable, value-added industry. A locally owned, small scale industry, which focuses on cutting less wood while extracting more value and jobs from each board foot, could serve as an important "leg" of POW's economy, while reducing impacts on subsistence, commercial and sport fishing and the growing tourism industry. Recently, the City of Craig began the search for wood product manufacturers interested in setting up operations in the area. Sales like Lab Bay, Chasina and Control Lake, if offered at all, should be reconfigured and scaled down in order to accommodate transition to a small-scale, locally owned timber industry.

Purpose and Need

**The Forest Service is violating NEPA by Failing to Consider "Significant New Circumstances or Information Relating to the Proposed Action."**

The DEIS explains:

"The purpose and need for this project is to implement direction contained in the Tongass Land Management Plan (TLMP 1979a as amended) to help provide a sustained level of timber supply to meet annual and TLMP planning cycle market demand and to provide local employment in the woods product industry."

The DEIS further explains under the Timber Demand section summary page 6 :

"There is demonstrated mill capacity in the region to process logs, if a timber supply is available. There is also a projected need for the timber volume being considered from this project area for the Forest Service to come closer to meeting an objective of providing a three-year supply of timber under contract to the existing dependent industry."

TCS-2

And the DEIS further states under Reasons for Scheduling EA for the Chasina Project Area summary page 7:

"Providing substantially less timber volume than required to meet TLMP and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the Chasina Project Area or other project areas would not meet contract requirements and is otherwise not necessary or reasonable."

In response, the question must be asked: "What contract?" On February 21, 1997, the Clinton Administration and LP announced a final agreement canceling the KPC contract. Pursuant to this agreement, " Any rights of KPC and LP to receive any timber under the contract other than the Specified Offerings are hereby canceled." See Paragraph I.3, at p.4 (Exhibit 1)



## Comments from Tongass Conservation Society

3

TCS-2  
(cont.)

The Forest Service's reasoning for scheduling this project now not only defies reality, it violates Section 101 of the Tongass Timber Reform Law. As noted by Congressman George Miller, House Floor manager throughout Congressional debate and deliberation on over the Tongass Timber Reform Law:

Section 101 puts a halt to the Forest Service's "timber first" approach to managing the Tongass. The Forest Service originally interpreted ANILCA section 705(a) as a mandate to offer 450 million board feet of timber annually, no matter what the market demand, impact on multiple uses, or cost to the taxpayers. As amended section 705(a) requires that timber sale offerings even if consistent with other resource needs and sustained yield principles, must not be in excess of actual market demand.

136 Cong. Rec. H12833 (daily ed. Oct 26, 1990)(emphasis added)

It appears that in its haste to get this document out the door, the Forest Service chose to ignore the reality of the pulp mill closure. **Appendix A in the Chasina DEIS is inaccurate and irrelevant.** Nowhere in the DEIS does the Forest Service even acknowledge that the KPC mill closed, despite the fact the announcement of closure was made all the way back on October 7, 1996. *Ketchikan Closure Certain*, Juneau Empire Oct. 7 1996 (exhibit 2). In addition to the KPC mill, which is being disassembled, the Forest Service's various "reported capacity consumption scenarios" include such facilities as APC's Wrangell sawmill, which hasn't operated in over three years, and Seaborne Lumber, which is also out of commission. Clearly, the Forest Service has turned Section 101 of the Tongass Timber Reform Law on its head. If the information contained in Appendix A the of the Chasina DEIS is any indication, the Forest Service is misinterpreting Section 101 of the Tongass Timber Reform Law. Instead of moving to "seek to meet existing market demand" as the TTRL directs, the Forest Service is attempting to create new market demand. A new analysis of timber supply and demand, which reflects present day reality is needed.

TCS-3

Moreover, the DEIS fails to consider the full range of socio-economic impacts industrial scale logging has on Prince of Wales Island. The DEIS devotes scant time and attention to the growing economic value of tourism and recreation, small, value-added timber operations and achieving community stability through economic diversification. SEACC has taken a first, small step at modeling a new kind of timber industry. The model was presented to the Governor's Southeast Regional Timber Task Force (see exhibit 3) Such an industry will produce far more local jobs for each board foot of timber utilized.

TCS-4

For further analysis of Appendix A of the Chasina DEIS, see SEACC's appeal of the Lab Bay FEIS and ROD p 2-14 (see exhibit 4)

## Responses to Tongass Conservation Society

TCS-3

Pages 256 through 289 of the draft EIS were devoted to discussing the socio-economic environment. This is of sufficient detail to provide the Deciding Officer information in order to make an informed decision.

TCS-4

The Regional Forester affirmed the Forest Supervisor's decision to implement Alternative 6, as modified, for the Lab Bay Final EIS and ROD. The Appeal Reviewing Officer found that Appendix A not only discussed timber supply obligations under the long-term contract but also provided a detailed discussion of the overall demand for Tongass timber supply in Southeast Alaska (letter to Appeal Deciding Officer, dated April 16, 1997).

**The Range of Alternatives is Unreasonably Narrow and Unlawful Because the Agency Has Failed to Follow the Area Analysis Process Required by TLMP, as Amended.**

The National Forest Management Act requires compliance with the provisions of the Tongass Land Management Plan (TLMP). According to TLMP, as amended in 1986, an area analysis is required to determine the locations of feasible projects prior to detailed, site specific planning. TLMP provides that Area Analysis, " will follow the NEPA process" and "provide opportunity for public comment." The Area Analysis process ensures the opportunity to consider alternative project locations in connection with this public process. Instead of preparing an area analysis with alternative project locations that may have avoided additional logging in the Cholmondeley Sound area, the Forest Service skipped straight to the site specific project implementation EIS. The Forest Service violated NFMA when it failed to follow the Area Analysis for the Ketchikan Area as required in TLMP, as amended. See, Friends of Southeast Future v. Morrison, No J96-001 CV (D. Ak. Jan 10. 1997)

TCS-5

The Forest Service's failure to perform an Area Analysis with full, NEPA-based public participation as required by TLMP deprived the public of any opportunity to participate in process designed specifically to make the fundamental decisions concerning where logging would occur. Instead, the agency made project location decisions through the internal meetings which occurred years before the public timber sale process began for this sale. Therefore, the Forest Supervisor's contention the Chasina DEIS is consistent with TLMP is arbitrary.

**The Exclusion of the Public from the Decision to Log in the Chasina Project Area Violates NEPA**

When the Forest Service prepared the Chasina EIS pursuant to its timber sale schedule without considering other alternative possible places to meet timber goals, the agency reduced the choices to two: either log substantially in the Chasina project area or fail to meet its timber goals. However, the public was never given a meaningful opportunity to influence the decision of where timber volume goals and would be met or how that might be done without sacrificing the environmental values of the area. Instead, as noted above the decision to log in this project area was made outside the public process when the agency adopted its timber sale schedule.

TCS-6

When the Forest Service adopted its timber sale schedule it effectively eliminated adoption of the no action alternative. While the schedule itself may not have authorized the agency to proceed with logging in the Chasina project area, it ensured that logging would indeed occur because the agency failed to consider alternative project areas in the Chasina DEIS in the quest to meet predetermined timber goals. The selection of the "purpose and need"

TCS-5

A mid-level NEPA analysis, to be followed by project NEPA analysis, was not the intent of "Area Analysis" as described by the TLMP. This is further clarified in Region 10 Supplement No. 1 to the Forest Service Handbook 1909.12 - Land and Resource Management Handbook. Section 5.2 explains the project analysis process, and differentiates between the development of schedules and the NEPA analysis of individual projects.

TCS-6

Through the TLMP Revision process the public was given the opportunity to provide input into how different portions of the Tongass should be managed. Through the use of Land Use Designations (LUD's), certain portions of the Tongass have been designated for timber management (TM). Appendix A displays to the public the schedule in which areas will be entered for timber harvest



for this project was, in fact, part of a broader process that denied the public an opportunity to participate meaningfully in the decision whether to allow logging in the Chasina project area. Although an agency has discretion to define project purposes, NEPA does not permit that agency to circumvent public participation when making its most important decisions.

The Forest Service admits as much in the DEIS Summary, page 7

Providing substantially less timber volume than required to meet TLM and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the Chasina Project Area or other project areas would not meet contract requirements and is otherwise not necessary or reasonable.

**Expansion of the road network by constructing approximately 38 miles of new system roads under the preferred alternative violates NFMA and is inconsistent with the Alaska Regional Guide.**

Because the Forest Service failed to do an area analysis as required under the 1986 TLM as amended, the agency did not give the public information needed to make fully informed decisions. To go from a forest wide analysis to a project level analysis on a forest as vast as the Tongass fails to provide the public and decision makers the information needed to evaluate the impacts of road development in the project area.

We have many concerns relating to the proposal including:

**Road building costs:** Road building and road reconstruction under the preferred alternative will cost over \$7 million. What timber operator on the Tongass and more importantly, on Prince of Wales Island, could possibly afford this? This sale does not appear to be economically viable.

**High MMI Soils:** Under the preferred alternative, the Forest Service has proposed to log 418 acres of high MMI soils. The Forest Service needs to disclose whether any road building will occur on those high MMI soils. No road building should occur on high MMI soils. This could result in adverse impacts to long-term soil productivity and increased risk of landslides and stream sedimentation. If logging is to occur on high MMI soils, all timber should be removed by helicopter. In addition, the Forest Service should not allow any logging on very high MMI soils. Under the preferred alternative, 32 acres of very high MMI soils are under consideration for logging. This seems to be in direct contradiction to statements made elsewhere in the DEIS.

## Responses to Tongass Conservation Society

TCS-7

Timber sales related to this FEIS will be sold over a period of time and in smaller sales rather than just one large sale. This will allow for smaller road building projects and sales so that any one operator would not have to have the financial backing to do the entire project.

TCS-8

Table Soils-8 discloses the amount of road building on high MMI soils. There are not any Forest-wide Standards and Guidelines that prohibit road construction on high MMI soils. TLM (1997) Forest-wide Standards and Guidelines listed in the Soil and Water section (pages 4-83 through 4-85) and the Transportation section (pages 4-104 through 4-110); and BMPs 13.5 and 14.7 specify protection measures on high and very high MMI soils.

There are not any Forest-wide standards and guidelines that require helicopter yarding on high MMI soils. Tentatively suitable criteria in the TLM 1997 (pages A-6 through A-7) specifies partial or full suspension for high MMI soils. All known very high MMI soils have been removed from proposed harvest units. Values in Table SOILS-9 are for units 681-373 and 682-301, which have been modified to exclude areas of very high MMI soils. The GIS layer will be changed for the final to match field observations.

TCS-7

TCS-8

TCS-8  
(cont.)

Lands with very high mass movement rating (very high MMI) are most likely to fail by landslides. Areas having very high MMI are not included in the suitable timber base for the project area. Vol. 1 chapter 3, page 81

Is there proposed cutting on very high MMI soils or not? This is unclear in the DEIS

The Chasina DEIS subsistence findings do not comply with Section 810 of ANILCA

Section 810 of ANILCA gives subsistence a higher priority than general "multiple use" balancing. According to the Chasina DEIS logging in the project could lead to "significant possibility of significant restriction of subsistence wolf use." To allow restriction of subsistence in order to balance for other resource needs, ignores the higher priority given to subsistence uses in the statutory scheme. If balancing was all the Forest Supervisor had to do to make a restriction of subsistence necessary, then all restriction of subsistence would be necessary and the statutory requirement to make this determination would be superfluous. Thus, Congress must have intended that protection of subsistence take priority over general multiple-use resources.

TCS-9

TCS-10

The new percentage is more than 20% of a watershed acres with trees in second growth younger than 30 years. However, this is not meant as a threshold of no more harvest, but rather a level of harvest which needs more analysis (a watershed analysis) to make sure resource values are protected. A watershed analysis was completed for watersheds of concern (see the RMA and Watershed section of the Final EIS), which included running a sediment risk model for all watersheds in the project area, high risk watersheds were identified and recommendations were made to delete roads and units. Harvest units were prioritized and were visited on the ground to protect streams, soils, wildlife, karst and other resource values. Areas not meeting Forest-wide standards and guidelines were deleted from the unit pool. Stream buffers were prescribed to protect streams and the Riparian Management Area.

TCS-10

The majority of watersheds (VCUs) in the project area have experienced prior roading and road construction. Reentering these drainages may generate greater potential risk for impacts on water quality, with the risk expected to be greater in those watersheds with the higher cumulative effects of harvest.

Some of watersheds listed in table SUM-7, page 28 of the summary of the DEIS indicate the amount of logging that has already occurred in several watersheds in the project area is far in excess of standards and guidelines associated with Alternative P of the 1991 TLMP Draft Revision. The summary further indicates this standard and guideline is being discarded in the 1996 TLMP RSDEIS (1996a). What standard will take its place and how do the findings in the SUM 7 table relate to these new standards and guidelines?

TCS-11

In order to adequately protect fish habitat in the project area, the Forest Service should adopt the Recommendations of the 1995 *Anadromous Fish Habitat Assessment*. Also, the SUM-7 table on Page 28 of the summary is confusing and frustrating. A better watershed map, highlighting areas logged on both public and private land, needs to be made available so the public can determine where these watersheds are and what level of impact has occurred. The analysis must include cumulative impacts of activities in entire watersheds.

TCS-9

Section 810 (a) (3) of ANILCA requires the Forest Service, "in determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands..." to hold public hearings and make specific findings regarding restrictions on subsistence uses. Section 810 (d) emphasizes the procedural nature of this requirements: "After compliance with the procedural requirements of this section and other applicable law, the head of the appropriate Federal agency may manage or dispose of public lands under his primary jurisdiction for any of those uses or purposes authorized by this Act or other law." The Chasina Project has complied with the procedural requirements of Section 810 of ANILCA; 810 Subsistence Hearings were held in Hydaburg (March 18, 1997), in Saxman (March 20, 1997), the Draft EIS had made specific findings regarding restrictions on subsistence uses (pages 312 through 325) and a final finding is included in the Final EIS and ROD.

TCS-11

The sediment risk model run for all watersheds in the project area assumed that all native land had been harvested and was in second growth. Table SUM-7 was developed from satellite imagery of the project area as of August 1995 and displayed what had been harvested on native and National Forest System lands at that point in time. For better watershed maps see the Watershed section in the Final EIS.



## Comments from Tongass Conservation Society

## Responses to Tongass Conservation Society

7

TCS-12 In addition, the 107 proposed stream crossings, including 17 class I and 18 class II crossings, ignores advice provided by the agency's own scientists in the *Anadromous Fish Habitat Assessment*, and will likely lead to degradation of important habitat.

**The Forest Service's Proposed Wildlife Conservation Strategy Proposed in the Chasina DEIS is Inadequate and Illegal**

In commenting on scoping for the Chasina project, SEACC requested that the Forest Service consider "all of the immediate actions recommended by the Interagency Viable Populations Committee-in response to the scientific peer review of the Committee's proposed wildlife conservation strategy-must be considered to ensure the maintenance of viable wildlife populations as required under the National Forest Management Act (NFMA.) A reasonable explanation based on credible scientific information must be presented for alternatives not applying these recommendations."

The Chasina DEIS fails to disclose the Peer Review's recommendations for strengthening the VPOP Committee's proposed strategy, or the VPOP Committee's May 1994 response to the Peer Review's recommendations. In particular, the Chasina DEIS has failed to disclose or evaluate the Peer Review's call for immediately implementing measures to maintain management options for conserving wildlife habitat until completion of the TLMP revision. The failure to disclose or evaluate these recommendations violates NEPA, as does the failure to publicly disclose the reasoning behind the acceptance and rejection of portions of the VPOP team's findings. The Forest Service's wildlife conservation strategy contained in the Chasina DEIS is inconsistent with the best available science. While the Forest Service did take an important first step by implementing some of the recommendations of the VPOP committee, they failed to implement all of their recommendations or provide reasoned explanation for the decision.

Several Assertions Made in the Chasina DEIS Wildlife Section Need Further Explanation and Analysis.

The Forest Service needs to fully analyze cumulative impacts of private land roading and logging adjacent to the project area, particularly in WAA 1211. How is habitat degradation due to logging determined throughout WAA 1211?

Also, more analysis needs to be done on the proposed road connection in Big Creek Sulzer Portage area. Development by Hydacorp is ongoing. Access to the project area from Hyدابurg residents could lead to significant increase in hunting pressure in the project area.

TCS-12

All stream crossing are reviewed by the project fish biologist with passage and timing restrictions placed on Class I and Class II stream crossings. TLMP (1997) calls for maintaining fish passage through stream crossing structures, using juvenile coho as the design species for upstream fish migration in Class I streams and resident trout and dolly varden in Class II streams.

TCS-13

The Chasina Project Area is consistent with the VPOP strategy, as a part of the TLMP Revision process, large and medium old growth reserve areas were modified and small old growth reserve areas mapped. All old growth reserve areas have been reviewed by U.S. Fish and Wildlife Service and ADF&G, this review lead to the expanding of the small old growth reserve area out on Chasina Point.

TCS-14

Same response as to FWS Comment #19.

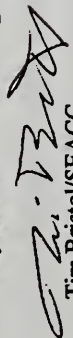
TCS-15

The road system being developed by Hydacorp in the Big Creek/Sulzer Portage area is private property and not open for public access. This comment has been added to the Final EIS.

"The biggest change would be an increase in access to the project area if roads constructed on Hydaburg Native Corporation lands in the Bid Creek and Sulzer Portage Area are connected to Hydaburg." Chasina DEIS Vol. 1, Chapter 3, page 316.

Thank you again for the opportunity to comment:

  
Tracy Smith/TCS

  
Tim Bristol/SEACC



## Comments from Ketchikan Pulp Company



Post Office Box 6600  
Ketchikan, Alaska 99901  
U.S.A.  
TEL 907 225-2151  
FAX 907 225-8260

April 25, 1997

Forest Supervisor

USDA Forest Service Alaska Region

Tongass National Forest

Ketchikan Area

ATTN: Chasina EIS

Federal Building

Ketchikan, Alaska 99901

## Responses to Ketchikan Pulp Company

KPC-1

Two factors that shifted the economics in favor of Alternative 2 verses Alternative 5 were that Alternative 5 required the construction of a new LTF whereas Alternative 2 did not and the volume/mile of road was much higher in Alternative 2. These extra factors were a result trying to harvest the most wood available in an economic manner with Alternative 5, whereas Alternative 2 concentrated on minimizing environmental impacts by concentrating harvest activities to areas where the main road system was already developed.

Thank you for the opportunity to comment on the Chasina DRAFT Environmental Impact Statement.

The DRAFT EIS states that Alternative 5 was designed with the objective to emphasize timber economics and conventional cable yarding methods, yet that alternative ranked third in terms of economics. The most economical alternative, according to the EIS, had a mid-market value of -\$23.45, while alternative 5 had a mid-market value of -\$37.08. A quick look at the economic data on Table SUM-2 shows that the goals for economics were not met. Why are the

KPC-1

OPERATING DIVISIONS  
WARD COVE PULP MILL  
THORNE BAY LOG  
KETCHIKAN SAWMILL  
TUXEAN LOG  
ANNETTE HEMLOCK SAWMILL  
EL CAPITAN LOG  
NAUKATI LOG

) economic indicators, for an alternative designed to be economical, no better than those that are were designed to protect and avoid wildlife habitat, and maximize helicopter logging? In the past, there seems to have been an assumption that more volume harvested produces greater economical benefits, helicopter logging is too expensive, and wildlife and fish habitat, soil and water quality have to suffer. After looking at this EIS, it appears that some or all of these assumptions are not correct. The alternative designed to protect unfragmented oldgrowth has the same average unit size, and better volume per acre than the alternative seeking the greatest economical benefits. The alternative seeking to maximize helicopter harvest appears to be \$12.03 per mbf better than the alternative seeking the greatest economical benefits.

KPC-1  
(cont.)

- Alternative 5 proposes to harvest 69 mmbf, Alternative 2, 35 mmbf, and Alternative 4, 87 mmbf.
- Alternative 5 proposes to construct 39.3 miles of road (new specified construction and temporary road) for 1.755 mbf/mile recovery. Alternative 2 proposes to construct 14.4 miles of road for 2.430 mbf/mile recovery. Alternative 4 proposes to construct 23.9 miles of road for a recovery of 3.640 mbf/mile of road built.
- Alternative 5 proposes to harvest 15% of its volume by helicopter and 68% by Running Skyline, Alternative 2, 28% by helicopter and 62% by Running Skyline, Alternative 4, 40% by helicopter and 46% by Running Skyline. Alternative 5 has the lowest helicopter to Running Skyline ratio, but has the worst sale economics.



### Comments from Ketchikan Pulp Company

The DRAFT EIS states that all of the issues within the scope of this project;

- Fish and Water Quality
- Recreation and Scenic Quality
- Wildlife
- Subsistence
- Caves and Karst
- Social and Economic Effects
- Marine Environment

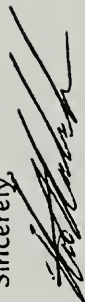
will be met regardless of the alternative chosen, with the exception of Timber Economics and Supply.

KPC submits that the Forest Service should analyze Alternatives 2, 4, and 5 and formulate a combination of the three alternatives, which would seek the optimum amount of road building, conventional to unconventional harvest methods, unit size, volume per acre, and recovery per mile to provide the best value for the resources.

KPC-2

Thank you for your consideration

Sincerely,



Kent Nicholson

Contract Manager

### Responses to Ketchikan Pulp Company

KPC-2

Alternative 3, the Preferred Alternative, does the best job of optimize timber sale economics while protecting resource values.

## City of Saxman

March 25, 1997

U.S. Forrest Service  
Subsistence Issues  
Federal Building  
Ketchikan, AK 99901

RE: U.S. Forrest Service Office Meeting, March 20, 1997, Saxman


Members of the City Council of Saxman have asked me to convey to you their regrets for being unable to attend your Open House and meeting held in Saxman on March 20.

We had a conflict of schedules that evening with the City Council monthly meeting. That meeting had already been rescheduled once due to the Borough Mayor's Blue Ribbon Committee schedule.

The subject of subsistence is vital to the community of Saxman. Your work on this subject and efforts to involve the public are appreciated by the City Council.

Again, thanks for your efforts.

Sincerely,

  
Tom Fitzgerald  
City Administrator, City of Saxman



March 26, 1997

Brad Powell, Forest Supervisor  
Ketchikan Area, Tongass National Forest  
Federal Bldg.  
Ketchikan, AK 99901

RE: Chasina timber sale DEIS

Thank you for the opportunity to comment on the DEIS for the proposed Chasina DEIS. Too often, we take this opportunity for granted, but free speech and privilege to influence, even in an admittedly small way, government decisions exist only rarely. It is respectfully noted by this fisherman.

Brad, have not taken the time to read this document thoroughly, but have two comments that want you to personally consider.

1. This sale is way too big, and is the perfect example of the out-of-control nature of the Tongass timber sale program.
2. Please don't cut any timber or build any roads in the peninsula between Pt Johnson, Moria Sound, and North Arm.

11. The sale is too big

The scoping announcement said the sale was going to be 40 mmmbf. Now the DEIS says it's going to be 50 mmmbf, with all action alternatives except one exceeding 60 mmmbf. The rationale for yet another sale-from-hell is that TLMF 1979 mandated the Tongass cut 450 mmmbf annually and had a vague notion some of the logging could occur on SE Prince of Wales. That is the 'science' on which Chasina is based. The USFS needs to do the mid-level Area Analysis, as directed by TLMF 1979 to firm up this admittedly 'vague notion'. That is the 'science' required. Do you see the inconsistency?

Timber supply assumptions of the TLMF 1979 have been shot full of holes. Everybody knows they had been reverse-engineered to satisfy the requirements of the two long-term contracts. That's a fact, and continued denial of that fact violates the first premise of Alcoholics Anonymous

The long-term contracts are gone, and a new timber industry has to be developed from the ground up. It needs to be based on a long-term, sustainable logging level, which recognizes the singular fact that SE AK wood processing facilities are projected to focus on old-growth logs. Typically, stands don't even begin to exhibit old-growth characteristics until 250 years. Yet the USFS has yet to develop ANY alternative for ANY environmental analysis which talks about anything BUT short rotation second-growth forests. Do you see the inconsistency?

Information, such as the MELP and field reconnaissance results on pp 33-244 need to be analyzed in a meaningful way in order to provide

|                                 |                     |
|---------------------------------|---------------------|
|                                 | USDA FOREST SERVICE |
| R E C O R D I N G               |                     |
| MAY 27 1967                     |                     |
| F O R E S T S U P E R V I S O R |                     |
| PAGE 10                         |                     |
| FS                              |                     |
| EIS                             |                     |
| FS SPECIAL AGENT                |                     |
| ADMIN                           |                     |
| EDD                             |                     |
| CNS                             |                     |
| PAJ                             |                     |
| PLANNING                        |                     |
| REC & LANDS                     |                     |
| TIMBER                          |                     |
| CRAID RD                        |                     |
| KETCHIKAN PD                    |                     |
| MULTI FOREST SEE                |                     |
| THURSDAY AM                     |                     |
| GOTHER                          |                     |

## Responses to Bill Shoaf

BS-1

The volume stated in the Purpose and Need section is an estimate of the approximate volume that could safely meet Forest-wide standards and guidelines within the project area. With the implementation of the TLMP (1997), new S&G's and new Land Use Designations have reduced the area which is available to timber harvest. For the Final EIS, alternatives range from 25.6 MMBF (Alt. 2) to 66.7 MMBF for Alternative 6 (max. unit pool). The Preferred Alternative (Alt. 3) is 42.5 MMBF.

BS-2 Same response as TCS -2

BS-3

The mid-market analysis used is only a comparison of indicators to give a relative rating. There is no way to predict future timber market conditions. If during the timber bidding process, timber operators believe that a given sale is not profitable, they will not bid on it. Even if a sale goes "no-bid" it can be advertised again once markets improve.

## Comments from Bill Shoaf

validation monitoring about how much of the TLMP timber base is and isn't economical to log under environmental law and TLMP standards and guidelines. Given the flux in the timber industry, why are you even proposing a sale where every mid-market stumpage projection is severely deficit. The USFS can't keep delaying the hard decisions for the night-shift, because there isn't one. And you damn well better get one. The embryonic timber industry deserves to be built on the solid foundation of how much the Tongass can realistically produce...not vice versa.

BS-3  
(cont.)

Please table this sale until the new TLMP is implemented, or else scale it down considerably. Would favor a range of alternatives between 5 and 40 mmbf, with a serious look at the no action alternative.

### 2. No logging or road building in extreme SE Chasina

There is a triangle almost pinched off between Pt. Johnson, Moria Sound, and North Arm. It includes portions of VCUs 681 and 682. This area contains the best commercial fishing boat anchorage in Moria Sound, and is largely a vegetation screen, as opposed to topographical lee. Logging or road construction would compromise this anchorage.

BS-4

During big blows, the other topographical anchorages in Moria Sound experience severe williwaws. Personally rode out last Spring's 87 knot hurricane in Moria, and got to observe first-hand the unhappy phenomena of dragging anchor in the 'name' anchorages.

So please, no logging or road construction here, OK?

That's it, other than I request that the Forest Supervisor personally review these comments.

*W.R. Shoaf*  
Bill Shoaf

10437 Kingfisher Road  
Ketchikan, AK 99901

## Responses to Bill Shoaf

BS-4

All proposed roads in this area have been dropped, new Forest-wide standards and guidelines call for a 1,000 foot beach buffer, and unit 682-303 has been dropped from all alternatives due to soils concerns. However, other harvest units that meet S&G's are proposed for helicopter harvest.





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Service  
National Geodetic Survey  
Silver Spring, Maryland 20910-3282

MAK 20 1997

USDC-1

All known geodetic control monuments will be protected by use of timber sale contract clauses.

MEMORANDUM FOR: Donna Wieting  
Acting Director, Ecology and Conservation  
Office  
FROM: *Donna Wieting*  
Captain Lewis A. Lapine, NOAA  
Director, National Geodetic Survey  
SUBJECT: DEIS-9703-02--Chasina Timber Sale Alaska  
Region

The subject statement has been reviewed within the areas of the National Geodetic Survey's (NGS) responsibility and expertise in terms of the impact of the proposed actions on NGS activities and projects.

All available geodetic control information about horizontal and vertical geodetic control monuments in the subject area is contained on the NGS home page at the following Internet World Wide Web address: <http://www.ngs.noaa.gov>. After entering the NGS home page, please access the topic "Products and Services" and then access the menu item "Data Sheets." This menu item will allow you to directly access geodetic control monument information from the NGS data base for the subject area project. This information should be reviewed for identifying the location and designation of any geodetic control monuments that may be affected by the proposed project.

If there are any planned activities which will disturb or destroy these monuments, NGS requires not less than 90 days' notification in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project includes the cost of any relocation(s) required.

For further information about these monuments, please contact John Spencer; SSMC3, NOAA, N/NGS; 1315 East West Highway; Silver Spring, Maryland 20910; telephone: 301-713-3169; fax: 301-713-4175.

USDC-1





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10

1200 Sixth Avenue S.W. - 888  
Seattle, Washington 98101

May 5, 1997

Reply To  
Attn Of: ECO-088

Norm Matson  
Ketchikan Administrative Area  
Tongass National Forest  
Federal Building  
Ketchikan, Alaska 99901

Dear Mr. Matson:

We have reviewed the Draft Environmental Impact Statement (draft EIS) for the proposed Chasina Timber Sale in accordance with our responsibilities under the National Environmental Policy Act and §309 of the Clean Air Act. The draft EIS analyzes five action alternatives to harvest between 33 and 124 million board feet of timber on Prince of Wales Island in southeast Alaska. The draft EIS identifies Alternative 3 as the preferred action alternative.

Based on our review, we have rated the draft EIS EC-2 (Environmental Concerns - Insufficient Information). This rating and a summary of our comments will be published in the *Federal Register*.

Our primary concerns, which are related to the purpose and need for the project, potential impacts to water quality and the marine environment, and the commitment to implement necessary and appropriate mitigation measures, are highlighted below.

- |       |   |
|-------|---|
| EPA-1 | 1) We are concerned that the purpose and need for the project is based on the requirements to fulfill the now-canceled Ketchikan Pulp Company long-term timber contract. This raises questions in our minds related to the fundamental need for the project.  |
| EPA-2 | 2) We are concerned that some of the road closure methodologies proposed in the draft EIS are inconsistent with Alaska state regulations and would result in potentially significant impacts to fish habitat and water quality. Also, because the Forest Service is proposing to keep some of the roads constructed for this project open at the completion of harvest activities, we recommend that you contact the Army Corps of Engineers to determine if permits pursuant to Section 404 of the Clean Water Act would be required for such roads. |
| EPA-3 | 3) We are concerned that implementation of any of the action alternatives would result in the disturbance of greater than 35 percent of the acres of five watersheds (E94A, H27A, H38A, H54A, H63A) within a 15 year period. This appears to conflict with Standard and   |

Ref:95-103-AFS

Same response as TCS -2

Same response as FWS -22, plus, The Forest Service has been coordinating the Chasina Project with the Army Corps of Engineers-Juneau Office.

Same response as TCS -10. Plus a Watershed Analysis section has been added to the Final EIS that addresses all watersheds of concern.



## Comments from United States Environmental Protection Agency

Guideline S&W112 of the 1991 proposed revised Tongass Land Management Plan which is intended to minimize the cumulative watershed effects of management practices on the Forest. We also believe more information is needed to relate the results of the three watershed analyses that were conducted to all the other watersheds within the project area for which such analyses were not conducted.

- 4) We recommend that the Forest Service consider the use of helicopter logging and helicopter transfer to barge or water for the areas that would be served by the proposed log transfer facilities (LTFs) at the West Arm Cholmondeley and North Arm Moira locations. Given the relatively small volumes proposed to be harvested from these areas, along with the relatively isolated nature of these areas, we believe that this would be a less environmentally damaging and more cost effective approach to take. We also recommend that the EIS be revised to include additional information about conditions and resources in the vicinity of the existing and proposed LTFs, as well as a demonstration of how each site complies with the siting guidelines developed by the Alaska Timber Task Force.

EPA-4

- 5) We recommend that the final EIS provide a clear and firm commitment to expand upon and implement the mitigation measures identified in Section 3 of the EIS. As presently written, the EIS does not provide a clear indication of the specific mitigation measures that would be implemented if the proposed project moves forward.

EPA-5

Enclosed please find our detailed comments, which elaborate further on these issues as well as other areas of concern we believe need to be addressed in the final EIS. We have also enclosed a summary of the rating system used in our review. We are interested in working closely with the Forest Service in the resolution of these issues and I encourage you to contact Bill Ryan at (206) 553-8561 at your earliest convenience to discuss our comments and how they might best be addressed.

Thank you for the opportunity to review this draft EIS.

Sincerely,



for Richard B. Parkin, Manager  
Geographic Implementation Unit

Enclosure

cc: Kevin Hanley, ADEC  
Ralph Thompson, ACOE-Juneau

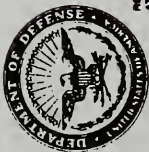
## Responses to United States Environmental Protection Agency

EPA-4

LTF's at these sites have been evaluated by USFWS and the NMFS and found to be acceptable sites for log transfer facilities; see Appendix E for the reports. All LTF's will meet the Alaska Timber Task Force guidelines as part of the permitting process. The Chasina IDT critically analyzed the option of helicopter harvesting remote/isolated areas. The LTF proposed for North Arm Moira has been dropped from consideration, all units on the Port Johnson peninsula will be helicopter yarded to a barge. The West Arm Cholmondeley area is still proposed for cable yarding, but if new information dictates that this is not feasible, this area could be switched to helicopter yarding also.

The Mitigation Measures section was reviewed with this comment in mind and changed made where appropriate.

EPA-5



DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, ALASKA  
P.O. BOX 898  
ANCHORAGE, ALASKA 99506-0898

REPLY TO  
ATTENTION OF

NOVEMBER 20 1997

Regulatory Branch  
East Section

Mr. Norm Matson  
Chasina Timber Sale  
US Forest Service, Ketchikan Area  
Tongass National Forest  
Federal Building  
Sitka, Alaska 99901

Dear Mr. Matson:

This is in response to the September 30, 1997, letter concerning the Chasina Timber Sale Draft Environmental Impact Statement (DEIS), describing proposed timber sale near Ketchikan, Alaska.

Based on information provided in the DEIS, we have determined that wetlands and waters which are under the Corps of Engineers' (Corps) regulatory jurisdiction occur within the project area. The Corps' regulatory authority that relate to timber harvest operations, are based on two laws. Section of the Rivers and Harbors Act of 1899 (33 USC 403) prohibits the obstruction or alteration of navigable waters of the United States (U.S.) without a permit from the Corps. In addition, Section 404 of the Clean Water Act (33 USC 1362) prohibits the discharge of dredged or fill material into waters of the U.S. including wetlands, without a Department of the Army permit.

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include "muskegs", forest swamps, marshes, bogs, and similar areas.

Excluding the no action alternative, the DEIS summary indicates that between 11 to 40 miles of new roads would be constructed in wetlands, depending on the alternative selected. These roads would affect between 1 to 367 acres of wetlands, and would provide access to between 861 and 2,086 acres of wetland timber, which would be harvested.

The construction or maintenance of forest roads used for the sole purpose of silviculture activities is exempt from regulation under Section 404 of the Clean Water Act, provided the roads are constructed and maintained in accordance with Best Management Practices (BMPs) listed at 33 CFR 323.4(a) to assure that flow and circulation patterns and chemical and biological characteristics of waters of the U.S. are not impaired, that the reach of waters of the U.S. is not reduced, and that any adverse effect on the aquatic environment is otherwise minimized. A copy of the mandatory BMPs is enclosed with this letter, and your particular attention is directed to BMPs (i) through (x).



Comments from Corps of EngineersResponses to Corps of Engineers

The Forest Service is in the process of providing wetland maps and field recon summary notes to the Corps.

COE-1

-2-

Same comment as EPA -4. Plus, necessary drawings and permit applications will be submitted to the COE if permits are required.

COE-2

Preliminarily, the roads may qualify under the 404(i) exemption. For our final determination, you should provide wetland maps for the Chasina project area with the final selection of harvest units and proposed roads to facilitate our review and determination of permit requirements and the status of any exemptions which may be applicable. If you are unable to provide this information, upon your request we will delineate the wetlands in the project area within the constraints of our current workload and resource allocations.

Under the Guidelines for Review of the Clean Water Act Section 404(F) Applicability to U.S. Forest Service Activities in the Alaska Region, which is currently under development by the U.S. Forest Service, Corps of Engineers and Environmental Protection Agency, the U.S. Forest Service has agreed to provide preliminary jurisdictional determinations (JD), and wetland mapping for Corps of Engineers' review and consideration. For purposes of wetland mapping any valid sources of information such as Wetland Inventory Maps based on the Cowardin classification system, the Tongass National Forest Soil Resource Inventory, plant association data, or the Classification and Delineations of Wetlands Using Soils and Vegetation Data, Tongass National Forest (Dewco, 1989), may be used as sources to support one or more wetland criteria (soils, vegetation, and hydrology), but can not be used as the sole source for making a final wetland determination. Preliminary wetland maps and jurisdictional determinations should, at a minimum, include a written description of the sources used, any mapping products generated, and a summary of the JD (i.e. field notes), at particular sites, if available. Additional information may be required, such as field delineation forms and notes, if our initial review is inconclusive.

COE-1

The DEIS also indicates that two new log transfer facility (LTF) options are being considered, which may require the construction of associated rafting areas and logging camps. Corps authorization is required for activities associated with this timber sale (e.g., LTF construction, float camps, rafting areas, land based logging camps constructed in wetlands, recreation facilities constructed in wetlands, etc.), and the submittal of a complete DA permit application, including detailed drawings accurately showing all such project components which would occur in waters of the U.S., including wetlands, is required.

COE-2

Impacts to waters of the U.S. should be a major consideration during your review of alternatives with regard to both meeting the Federal BMPs, and for those project components which would require individual Section 10 of the Rivers and Harbors Act of 1899 or Section 104 of the Clean Water Act authorization. For wetland development proposals requiring Corps authorization, Corps permits are available only for projects which clearly demonstrate compliance with the Clean Water Act Section 404(b)(1) guidelines, which state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, as long as the alternative does not have other significant adverse environmental consequences. In those cases where the activity associated with a discharge is proposed for a

-3-

"special aquatic site", such as wetlands, practicable alternatives are presumed to exist unless clearly demonstrated otherwise. The burden is on an applicant to provide a detailed and verifiable discussion of alternatives for our consideration. An alternative is considered practicable if it is available and capable of being accomplished after taking into consideration costs, existing technology, and logistics in light of overall project purpose. With regard to this proposal, sites for rock quarries, turnouts, ditch construction, and disposal areas (including areas where endhaul material is deposited), should be located to avoid or minimize impacts to aquatic resources to the maximum extent practicable in order to comply with the BMPs.

Enclosed is a copy of our Regulatory Program Applicant Information pamphlet, which includes a permit application. This pamphlet is designed to assist you in applying for a DA permit and provides general information and guidance on how to complete the permit application.

We appreciate your request for comments concerning this proposal. We are available for further discussion or clarification of our comments, as necessary, and encourage you to contact Mr. Terry J. Stone by telephone at (907) 790-4490, or at the letterhead address, at your earliest convenience in light of your need to proceed with your project plans.

Sincerely,

*Jeffrey K. Tower*

Jeffrey K. Tower  
Chief, East Section

Enclosures





United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Southeast Alaska Ecological Services  
3000 Vinegar Blvd., Suite 201  
Juneau, Alaska 99801-7100

IN REPLY REFER TO:

September 18, 199

Norm Matson  
USDA Forest Service  
Ketchikan Area  
Federal Building  
Ketchikan, AK 99901

Dear Mr. Matson:

This responds to your September 9, 1997, letter requesting updated information about threatened or endangered species that may occur in the vicinity of the proposed Chasina Timber Sale on Prince of Wales Island near Ketchikan, Alaska. Also enclosed is a current endangered and threatened species list for Alaska. For the purposes of the Endangered Species Act (ESA) Section 7 consultation, we offer the following comments:

Based on available information, the following threatened or endangered species may occur in the project area.

| Common Name               | Scientific Name                | ESA Status |
|---------------------------|--------------------------------|------------|
| American peregrine falcon | <i>Falco peregrinus anatum</i> | endangered |

This peregrine falcon subspecies may occur in the project area as a transient primarily during seasonal migration. No critical habitat has been designated for this species.

Thank you for the draft Biological Assessment for this project. The Service recommends the sections on the Alexander Archipelago wolf (*Canis lupus ligoni*) and Queen Charlotte goshawk (*Accipiter gentilis laingi*) be updated given the most recent petition findings for these species.

If you have any questions regarding this matter, please contact Ed Grossman or myself at the above address.

These comments are offered for endangered and threatened species for which the Service has responsibility under Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1521 et seq.) and its amendments. The above comments are

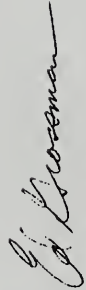
USFWS-1

The sections on the Alexander Archipelago wolf and the Queen Charlotte goshawk have been updated for the most recent petition findings. A copy of the final Biological Assessment has been sent to the USFWS to complete Endangered Species Act Section 7 consultation for the Chasina Project.

USFWS-1

specific to the Endangered Species Act and do not reflect agency concerns regarding other organisms or habitats for which the Service has legislated responsibilities.

Sincerely,



John Lindell  
Endangered Species Biologist



Enclosure

cc: USFWS-Ketchikan



Comments from U.S. Department of Commerce  
National Oceanic and Atmospheric Administration

Responses to U.S. Department of Commerce  
National Oceanic and Atmospheric Administration



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
P.O. Box 21668  
Juneau, Alaska 99802-1668

October 15, 1997

(11)

Marla Dillman  
Tongass National Forest  
Craig Ranger District  
P.O. Box 500  
Craig, Alaska 99921

RE: Chasina Project Area  
Section 7 Consultation

Dear Ms. Dillman:

We have reviewed the draft Biological Assessment and Biological Evaluation for the Chasina Project Area. This action includes the harvest of U.S.D.A. Forest Service timber lands on east Prince of Wales Island along South Arm, south of Cholmondeley Sound, and north of North Arm.

You have determined that the proposed action is neither likely to affect those listed species under the jurisdiction of the National Marine Fisheries Service, nor those species' designated critical habitats. Based upon the information that you have provided, we concur with your determination.

This concludes consultation on this action. Should your proposal significantly change, you may need to reinstitute consultation. If you need further assistance, please contact our Protected Resources Division (907) 586-7235.

Sincerely,

*Steven Penney*

Steven Penney  
Administrator, Alaska Region



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Southeast Alaska Ecological Services  
3000 Vintage Blvd., Suite 201  
Juneau, Alaska 99801-7100

15

IN REPLY REFER TO:

December 17, 1997

Norm Matson  
Chasina IDT Leader  
USDA, Forest Service  
Tongass National Forest  
Ketchikan Area  
Federal Building  
Ketchikan, Alaska 99901

Dear Mr. Matson:

The U.S. Fish and Wildlife Service has reviewed the biological assessment, dated December 10, 1997, for threatened and endangered species that may occur in the vicinity of the proposed Chasina Timber Sale on Prince of Wales Island, approximately 25 air miles southwest of Ketchikan, Alaska. The assessment evaluated the effects of proposed actions on the endangered American peregrine falcon (*Falco peregrinus anatum*).

For the purposes of Section 7 consultation, we agree that populations of the American peregrine falcon will not likely be adversely affected as a result of the proposed project.

Although not specifically required by the consultation provisions of the Endangered Species Act, we appreciate your consideration of the Service's Species of Concern in the biological assessment. Your consideration of these species is important for their conservation and assists in preventing their inclusion on the Endangered Species list.

These comments are offered for endangered and threatened species for which the U.S. Fish and Wildlife Service has responsibility under Section 7 of the Endangered Species Act of 1973 (16 USC 1521 et seq.) and its amendments. The above comments are specific to the Endangered Species Act and do not reflect agency concerns regarding other organisms or habitats for which the Service has legislated responsibilities.

Sincerely,

*Ed Grossman*

*John Lindell*  
John Lindell  
Endangered Species Biologist



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| 1  |                                      |
| 2  |                                      |
| 3  |                                      |
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| 6  |                                      |
| 7  | U.S. FOREST SERVICE                  |
| 8  | PUBLIC HEARING                       |
| 9  | DRAFT ENVIRONMENTAL IMPACT STATEMENT |
| 10 | March 20, 1997                       |
| 11 | Tribal House                         |
| 12 | Saxman, Alaska                       |
| 13 |                                      |
| 14 |                                      |
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| 20 |                                      |
| 21 |                                      |
| 22 | M. JUNE ZENGE                        |
| 23 | ZENGE'S SECRETARIAL SERVICES         |
| 24 | 525 Monroe Street                    |
| 25 | Ketchikan, Alaska 99901              |
|    | 907-225-5252                         |

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Zenge's Secretarial Services

P R O C E E D I N G S

1 HEARING OFFICER: Good evening. Why don't we go ahead  
2 and get started. I want to mention that this is a public  
3 hearing as provided by Section 910 of ANILCA to receive  
4 testimony on the Chasina Timber Sale project.

5 One thing I want to clarify is, there's been a lot of  
6 discussion lately in town about the deer harvest over on  
7 Prince of Wales Island in Game Management Unit II, and that's  
8 not the purpose of the hearing here tonight. That's a  
9 separate process. What we're here tonight to discuss is the  
10 Chasina Timber Sale and how that may affect your subsistence  
11 uses. So, if you could, please try to limit your comments to  
12 that.

13 May name is David Arrasmith. I live here in Ketchikan.  
14 I'm the planning staff officer for the Forest Service, and  
15 I've been designated as the hearing officer for this  
16 proceeding. For the record, today is March 20<sup>th</sup>, and the time  
17 is 7 p.m. This hearing is being held in Saxman, Alaska at the  
18 Tribal House.

19 Public notification of the hearing was made by  
20 publication in the Island News and the Ketchikan Daily News.  
21 The hearing is scheduled to run until 9 o'clock. It doesn't  
22 look like time is going to be any concern, so we'll let people  
23 testify as long as they'd like.

24 One thing I'd like to mention is, if you agree with  
25

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1 something that somebody else said, you don't have to repeat  
2 everything. You can just say I agree with James or with  
3 Tillie, and that's just as valid as repeating. Also, if you  
4 have any written testimony you'd like to leave with us, you're  
5 more than welcome to do this at the time.

6 We're recording the hearing so we can produce a  
7 transcript, a permanent transcript of the results, so we can  
8 help incorporate your comments into the final decision on the  
9 project. So, I hope people aren't intimidated by microphones  
10 or anything. That's not our intent. But we would like to  
11 have a permanent record of what is said so that we can  
12 consider the comments.

13 What I'll do is, I'll just -- I'm not going to go through  
14 the list since there's not that many people, but I'll just  
15 open it up, and if somebody would like to come up and give us  
16 some testimony, just feel free to do so. Come up and sit  
17 down, and try to speak into the microphone so that we can  
18 record you, and give us your comments on the Chasina Timber  
19 Sale.

20 So, is there anyone who would like to come up and give us  
21 some testimony?

22 MS. KUSHNICK: Mr. Chairman, I'd like to ask a question.

23 HEARING OFFICER: Yes.

24 MS. KUSHNICK: Why don't you go through and highlight  
25 what you're talking about? It will make it easier for us to

Zenge's Secretarial Services

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1 talk about it.

2 HEARING OFFICER: Okay.

3 MS. KUSHNICK: (Indiscernible.)

4 HEARING OFFICER: What we're talking about is a timber  
5 sale over on Prince of Wales Island, located in Cholmondeley  
6 Sound, in the South Arm and West Arm. The timber sale is  
7 proposed to harvest approximately 50 million board feet, and  
8 we have several different alternative methods of harvesting  
9 that timber.

10 The preferred alternative is displayed back up there on  
11 the map. And so really what we're trying to focus on is this  
12 timber sale over on the east end of Prince of Wales Island in  
13 Cholmondeley Sound. And part of what we tried to do was to  
14 have an open house to familiarize people with the project.  
15 And so I'm not sure if that helps or not.

16 And mainly what we would be interested, is over by  
17 Chasina Point, if you had any site specific areas of concern,  
18 any areas that are especially important for your subsistence  
19 use, areas of traditional use by your family or clan, or if  
20 there are any known sites that you would like to see  
21 protected, such as burial sites, et cetera.

22 Does that help? Come on up.

23 MR. CHARLES: I'm sorry, but I'm hard of hearing, and I  
24 cannot hear everything that you're talking about. If you're  
25 talking about the (Indiscernible) the Prince of Wales Island

Zenge's Secretarial Services

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1 area. My name is Melvin James Charles, and I started logging  
2 in 1959.....

3 HEARING OFFICER: Melvin, excuse me. Could you come up  
4 here? We can't.....

5 MR. CHARLES: My name is Melvin James Charles, and I  
6 started logging in 1959. Prior to that I became involved in  
7 commercial fishing back in 1940. And we fished in all the  
8 areas where fish was available throughout Alaska and down in  
9 Washington. But, when I started logging in 1959, and I  
10 believe it was about '64 when I started logging in 12-Mile  
11 Arm, and every year the fish came into 12-Mile Arm by the  
12 millions.

13 (Indiscernible) and all the creeks were full of salmon.  
14 And through the years that I logged there, I don't know  
15 exactly how many years that I logged in 12-Mile Arm, but every  
16 year the fish depleted by great numbers. And also, prior to  
17 that I used to fall fish in 12-Mile Arm. Many boats used to  
18 fish there. Now when you fish at 12-Mile Arm there's not  
19 enough fish that comes back in there to provide one boat with  
20 an income that would be sufficient.

21 White River was also an excellent producing salmon place.  
22 Many of our Native people are not aware of this, but I have  
23 been logging, high lead logging, Cat logging, skyline logging,  
24 any kind of logging that you could think of, I have done it.  
25 The only type of logging that I have never done is hoist

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Charles Testimony

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1 logging.

2 The White River is depleting more and more since Cape Fox  
3 logged that area. With this area that you're going to log is  
4 a much larger area than 12-Mile Arm. I am opposed to high  
5 lead logging, and it should be by helicopter logging only.

6 I have a lot to say on subsistence, but apparently this  
7 is not what you're doing here. So thank you, very much.

8 HEARING OFFICER: Thank you, Melvin. Is there anyone  
9 else that would like to come up and give some testimony? I  
10 notice that Tillie, you said, yes. So, would you like to come  
11 up?

12 MS. KUSHNICK: My name is Matilda Katherine Kushnick.  
13 A'Kinah, that's my Indian name. I'm a Klakon Kan Yidi (ph)  
14 (indiscernible). I come from the first house of the dog  
15 salmon tribe. I've raised 15 children. I have 48  
16 grandchildren and grandchildren. That'll be 49. I think I  
17 just got one more. And I'm happy to say, and I thank the Lord  
18 for it, that I did not raise my children on welfare or food  
19 stamps. I should be awarded from the Governor. We worked  
20 hard on our subsistence.

21 Yes, subsistence on land which logging has destroyed.  
22 Many of our — we have food up there and we have medicine.  
23 Our salmon streams, I complained before, at Snow Pass, from  
24 the logging, they're clear cutting, the lady slippers, gum  
25 boots, the kelp, seaweed, are great. How many times I brought

Zenge's Secretarial Services

Kushnick Testimony

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1 this up and I asked for a biologist to come back with a report  
2 on how this affects our food. This is the silt from the  
3 logging. There should be no clear cutting and they should  
4 have buffer zones far enough away from all the fish streams.

5 I know you folks are in an office. You don't see  
6 everyday things that's going on. These heavy equipment  
7 tractors, they're spilling oil wherever they work. One of my  
8 sons was in a camp and he seen and witnesses a fuel tank that  
9 turned over, a truck turned over, and all that fuel drained  
10 down. Nothing was done about it. And, you know, when these  
11 heavy equipment are running around in the woods there, they  
12 leave a lot of oil, and that washes down to the fish streams  
13 when it rains.

14 We log off our land here, we're going to be seeing our  
15 land just like what you watch on Channel 5 news how they're  
16 flooding out down there. You all know a tree drinks so many  
17 gallons of water a day, and their roots are down. On the way  
18 from Hollis to Kiawock there's landslides because they logged  
19 off the trees there. There's nothing holding the mud and  
20 stuff back, so you have you have your slides. We're going to  
21 be facing the same thing the Lower-48 is facing. That's  
22 what's happening to our land up here. Picking out logging  
23 away from our fish streams, away from where you know people  
24 will be staying eventually, will be a good — lot of steady to  
25 do that.

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Kushnick Testimony

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1 Our leadership in the Forest Service, I've been with the  
2 Forest Service a couple of years on anthropology and  
3 archeology, looking and finding where there was home sites.  
4 And don't forget, we are going to get this land back. As long  
5 as I'm alive, I don't care how old I get, I'm going to be  
6 fighting for our people's land, to get it back. This hurt me  
7 when Taylor wants to give land out to people. This is our  
8 land. We have a right to talk about it. Our trees are  
9 supposed to shelter our deer. They don't have shelters  
10 anymore.

11 An attempt by the State -- I'll read this, because you  
12 folks -- do you work for the government or the state?

13 HEARING OFFICER: The federal government.

14 MS. KUSHNICK: All right. You're our people. You don't  
15 work with us and comply with us, you know the state's going to  
16 take over and you won't be there to work.

17 Because of our serious reservation and concerns the  
18 following represents the official position of our Southeast  
19 Native leadership. It is important to note that this is an  
20 official position of the Southeast region only.

21 We believe the social and economic implications of  
22 subsistence are continually evolving and are diverse enough  
23 that each region must decide for itself whether or not a  
24 particular management regime will accommodate the needs of  
25 their committees. Any attempt by the state to effect a

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Kushnick Testimony

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1 legislative amendment to the ANILCA subsistence provision is  
2 unacceptable to the Southeast Native leadership. At this  
3 point in time the state must find a way to bring itself back  
4 into compliance with working with the regions to craft  
5 subsistence language acceptable to them.

6 The Southeast Native leadership rejects any language that  
7 strays or deviates from the original intent of the ANILCA  
8 subsistence provision, which protects the subsistence rights  
9 and the opportunity of the rural residents, and especially the  
10 Alaska Native people. The cultural implications of  
11 subsistence are critical to the further definition and  
12 formulation of subsistence language for the purpose of  
13 implementation by the state.

14 That, too, in the newspaper, you read where they don't  
15 say culture, they don't want to say aboriginal, they don't  
16 want any of these things. You know, I can't help feeling bad  
17 for these people. I would not go through their country and  
18 tell them how to change their culture of their lifestyle.  
19 Ours is the best in the world. We share with people.

20 One thing the Fish and Game, I don't think Forest Service  
21 ever done this to them either, to tell them there's three  
22 different kinds of fishing. There's commercial, personal use  
23 for all white people, black people, Filipinos, every  
24 nationality. Then there's subsistence for the Indians. And  
25 in the Black dictionary book, and in the law, it states, when

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Kushnick Testimony

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1 this food is going down, like our deer is getting scarce, all  
2 right, commercial loggers have got to stop. That's  
3 commercial -- for commercial fishing, everything has got to  
4 stop. Then it's depleting some more, then the personal use.  
5 These people didn't grow up on our food. They have to quit.  
6 After all, we taught them how to eat.

7 The last is subsistence through the federal government  
8 for the Native people has to be there, and this law was  
9 passed, and it's in the articles, Section 12, Article 12, I  
10 think it was. I got it backwards or whatever, but it's  
11 forever. Forever and ever. It didn't say for just so long.

12 So, subsistence, our way of life is from the water, and  
13 the land, and the air. We survived thousands of years. And  
14 I'm part of those people that began to live here before the  
15 flood. And it's up to you folks to use your best biologists  
16 to make sure that wherever there's fishing streams, those  
17 creeks, that the buffers are far away enough that it will not  
18 cause silt around the creek and along the waterline to keep  
19 that silt from washing over it.

20 How long Snow Pass -- first I talked about Red Bay. In  
21 Red Bay there's all kinds of creeks coming down into this bay.  
22 It's clear cut. And how many years ago that is, and there's  
23 still silt there. I covered a lot of these shores. I'm 70  
24 years old now, and you can imagine how many miles I've  
25 covered. I hunt, fish, and trap. I rowed. I rowed all

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Kushnick Testimony

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1 around Spanish Island, Warren Island, Kuiu, Shakan, all around  
2 there I rowed. And it was fun. We didn't even think it was  
3 work.

4 Now, Kay Andrews is threatening -- everybody's showing  
5 them, go get that purple book. Look at -- even Saxman's got  
6 red lines. I was part of that committee that was talking  
7 about boundaries. Like I said, our white people that's been  
8 here, born and raised here in Ketchikan, same age as my  
9 children, and the ones before, they were taught how to eat our  
10 food, and they respected it. Now the new generations come in,  
11 you teach them something, right now there's dollar signs in  
12 their eyes. Getting permits, starting permits to make profits  
13 on it. God gave us this to survive on, not to get rich. And  
14 what I don't like, that's why the West Coast is mad. People  
15 from Ketchikan come in cars over there. One year there was 47  
16 headless deer. Why didn't they have the decency to gut those  
17 deer out and give it to the needy? There's a lot of needy  
18 people in Ketchikan. Lots of them are hungry and starving.  
19 The same with other areas that could use the meat. The same  
20 thing they're doing in Anchorage with the moose. How many  
21 moose the trains kill. They just cart it out. And Etolin  
22 Island, what was it, two or three years ago they were  
23 shooting, oh, what was it, elk they were shooting all off  
24 because there's not much for them to eat on that island?  
25 Instead give it to whatever is near them, Eskimos, Aleuts, or

Zenge's Secretarial Services

Kushnick Testimony

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1 what. They could have gave it to them. No. They threw it  
2 away. And there's a lot of want and waste.

3 Last summer they threw all the fish overboard. That  
4 hurt. It really hurt. My grandfather made bows and arrows  
5 for us. One arrow to kill, one for target shooting. And he  
6 says, don't ever kill anything unless you're going to eat it.  
7 He says, if you kill a crow, you're going to eat it. He says,  
8 they've got a live and they want to live. You don't destroy  
9 anything. We get cedar from the trees to make our baskets and  
10 whatever, before we cut on that tree we pray, talk to that  
11 tree, because it's alive. It has spirits. Take just so much  
12 off. You don't take too much off of one tree because it'll  
13 grow back. Get some more from another tree. Same thing.

14 You talk to Esther Shay, she'll tell you the same thing.  
15 The spirits, they're alive. You talk to them and tell them  
16 what you're using it for, because that's what they're there  
17 for. But, if you just make fun of anything and just cut it  
18 down anyway and destroy them, and quoting from the Bible, man  
19 are going to destroy their own self, and you folks see it  
20 today, how things are going. Harvesting out our food, taking  
21 all our trees. We're going to have the same kind of weather  
22 the United States, Lower-48, is having.

23 In its attempts to implement the subsistence law and to  
24 bring us all back into compliance with ANILCA the state must  
25 begin to address the problems on a regional basis, and by

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Kushnick Testimony

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1 developing strategy with appropriate representation of the  
2 affected regions as contemplated by ANILCA. Yes. Our white  
3 brothers are -- they're worried on account of this pulp mill  
4 closing down, but they survived before that pulp mill ever  
5 came here to Ketchikan. We did. And now they're fighting  
6 over hunting.

7 If they only read the laws like they listen to Problem  
8 Corner all the time, and to the radios, and the newspapers,  
9 they're not giving the correct words out. They're all  
10 panicked. I wanted to tell them, but Bill wouldn't let me.  
11 Like I said, I almost said the wrong thing. My skin was the  
12 wrong color, otherwise they'd let me stand there all night  
13 talking. That's three things: commercial, personal, and  
14 subsistence. We'll all survive.

15 And one thing that hurts me is people destroying  
16 cemeteries. On this archeology and anthropology throughout,  
17 we see where there's cemeteries, and the Forest Service knows  
18 where these cemeteries are. I had to represent Joe Williams  
19 many times out here at the point, the cemetery. And the  
20 representatives of the Borough from Ketchikan come out and we  
21 argued and argued. They want to put a bridge from that  
22 cemetery point to Saxman. Finally I outtalked him a little.  
23 I says, all right, build it. I says, but we're going to  
24 collect the toll. And they quit talking about it. They moved  
25 it someplace uptown to put the bridge across.

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1 So, they're dead, but we respect our dead. They were  
2 once beautiful, loveable people. I told the Borough, if one  
3 of my family was buried across there I'd sue them for even  
4 talking about it. There's 17 of my husband's family buried  
5 across there. So, as Forest Service, like the state — down  
6 below Indians call you folks the White Fathers. Be — try and  
7 do your best and respect what's asked of you to look at these  
8 things where the cemetery — wherever Forest Service note on  
9 the records, it shows where there's Indian villages. Saxman,  
10 the people originate from all areas. All around anyway.  
11 Tongass. There are people there. Now it's all blocked off.  
12 Nobody could build or put trails there or nothing. Even the  
13 Kashakes belonged to my husband. His mother was born there  
14 and his grandaa was born there. They also were brought here  
15 to Saxman, and now it's reserved. See how they're stealing  
16 our land? There's cemeteries there, too. Even here on Blank.  
17 There's a cemetery on that island where everybody picnics.  
18 Wherever Natives resided, there's cemeteries, and respect it.

19 And respect the buffers. Make sure you folks see to it  
20 that there's buffer zones along the river beds and the  
21 shoreline so there's no silt because I don't know how many  
22 years more I'll be here, but I'll sure pass this down to the  
23 next speaker I know of my family to carry on, because — and  
24 I'm still — and I'm going to ask you again, make sure you  
25 have it on your notes, to have a biologist test these shell

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1 food there, and the kelp, and the seaweed to see if that silt  
2 makes them poison, or sick, or what, because it's gray.  
3 They're not the same color. And if I see anything wrong, you  
4 know I'll get a hold of you.

5 And again, like our subsistence, we taught the white  
6 people how to eat our food. I'm proud of it, but they're  
7 doing wrong with it. They're stealing it, and selling it, and  
8 making a profit of it, and this is for us to survive on.

9 Ketchikan, the white people and Indians survived  
10 beautiful before the pulp mill came in. They fished. There's  
11 a lot of Norwegian friends that I know uptown fished.  
12 Ketchikan was known as the salmon capitol of the world. My  
13 children were so hungry for fish one winter my husband went to  
14 every store in town. Couldn't buy fresh fish. Salmon capitol  
15 of the world. So, we have to protect our food and the logging  
16 has done a lot of damage.

17 Again, like I said, subsistence is not just in the water.  
18 It's in the woods. Our berries, our Indian medicine. There's  
19 a lot of things we subsist off of in the woods. There's  
20 vegetables there, too. I know if we should ever teach anybody  
21 that or they'll take the last of our food.

22 Anything you want to ask me?

23 HEARING OFFICER: No. Other than just to say thanks a  
24 lot, Tillie. Every time I listen to you I always learn a lot.

25 MS. KUSHNICK: I learned a lot. Had good teachers. Try

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Kushnick Testimony

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1 to bring it out in words that people could understand. It's  
2 a little difficult. Okay.

3 MR. AMUNDSON: Could I come up next? I have to go.

4 HEARING OFFICER: Sure. Come on up and state your name  
5 and then give us your testimony.

6 MR. AMUNDSON: My name's Pete Amundson. I live at 913  
7 Jackson in Ketchikan. I was appointed last year, by the  
8 legislature and by the Chamber of Commerce of Ketchikan as  
9 being the activist of the year in support of the congressional  
10 delegation, with a boat parade and the town meeting.

11 Tillie's right you know. She's protecting her aboriginal  
12 rights. I'm an honorary Eagle. I was made that the other  
13 night of the 40-day party for a friend of mine that I've known  
14 all my life. I want you people to know that these people that  
15 are talking out now are the very people that created the  
16 stovepipe hat totem pole. They knew, through the jungle  
17 telegraph, so to speak, about the great white father that was  
18 going to free the people. Why did they allow that president  
19 to come into Alaska when they'd just got done fighting a war  
20 to free slavery and bought back into slavery?

21 I'm here to say that the federal government has got to do  
22 something about Statehood Act. There's broken promises there.  
23 This is why we're pitted against one another. The federal  
24 government has done it. It's not the people of the State of  
25 Alaska. They created the Tongass Timber Reform Act. They

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1 never — they broke their promises in that, too. Every time  
2 they turn around they're breaking their promises, and the  
3 promises are pitting Charles, and Tillie, and all the rest of  
4 the people in Saxman against the people of Ketchikan.

5 I lived here when Bill Williams and I both graduated from  
6 the same class in Ketchikan High School. Or I should say Bill  
7 Williams and I. We fought hard, just from 1950 until now, to  
8 get people — I can remember in this town when the Native  
9 people could not shop in the Bon Marche. I can remember when  
10 the Native people could not sit in the loges in the Revilla  
11 Theater. Billy Williams, Tillie, Melvin, I can point to any  
12 number of people in this Saxman community that appreciated  
13 what Bill Williams, and Joe Williams, Sr., and Bill Williams,  
14 Jr. — or Joe Williams, Jr., have done for this community in  
15 itself.

16 But it's the federal government that's come here and  
17 pitted us against one another. We don't appreciate it.  
18 They're fighting for their aboriginal rights, and we're  
19 fighting to keep ourselves together. They're real proud of  
20 the fact that the federal government come in here and shelled  
21 Argoon, when they were the ones that created the problem.

22 The federal government had better get their stuff  
23 together and start taking care of the people of the United  
24 States, and take care of the people of Alaska, or they're  
25 going to have a revolution on their hands. This is bad

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1 business.  
 2 I come here the other night to a 40-day party, and I seen  
 3 things that are pointing that way. When they have the  
 4 slapping of the beaver's tail, that means something. That  
 5 means there's alarm. And when that — when those beavers come  
 6 back to life, there's going to be an element of surprise. I  
 7 was looking in the books the other night. The only time that  
 8 it's ever been drawn to a formal conclusion was Custer's last  
 9 stand, but they had a slapping of the beaver's tail then, too.  
 10 They're uniting their people. They're uniting their tribes.  
 11 There's a reason for it.

12 Tillie's brother's right up in Anchorage now in support  
 13 of Indian country. This Indian country is into Ketchikan.  
 14 The people of Ketchikan know this. There's a reason for it.  
 15 They have their rights. They lost their subsistence rights.  
 16 I like subsistence myself. My granddad come to Ketchikan in  
 17 1913, so I am a native Alaskan, too. I'm a native of Alaska,  
 18 not an Alaska Native.

19 I'm here to fight to their rights, and I'm here to fight  
 20 for my rights. And if the federal government is not going to  
 21 do something about it now — I've owned a tugboat. I own AK  
 22 Tug and Barge. I lost my tugboat. I paid off my debt to the  
 23 National Bank of Alaska and to SBA, but I had to sell my boat  
 24 to do it, and I had to sell my livelihood. Now I have to  
 25 leave the Ketchikan area for another job, and I don't

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1 appreciate it, and it was because of the downfall in the  
 2 timber industry that the federal government at one time had  
 3 room for four pulp mills in Alaska, but now they don't have  
 4 room for one.

5 It's not the trees. We have lots of trees. We just  
 6 don't have a forest anymore. We come — we were in Alaska  
 7 when all the Tongass National Forest was our forest. And now  
 8 we've got 1.7 million acres out of 17 million acres to try to  
 9 have some kind of an industry. Is this fair? I don't think  
 10 so. I don't like this situation. I've never been in it  
 11 before where the federal government was pitted — I pay my  
 12 taxes. I've never been late in the tax in my life, and yet  
 13 they turn around and take my livelihood away from me. No,  
 14 sir. This isn't going to fly, and it's not going to fly for  
 15 Tillie either. She's going to have her rights to hunt, just  
 16 like I'm going to have my rights to hunt, and we're not going  
 17 to be pitted one against the other.

18 We have a lot of problems that we've sifted and sorted  
 19 out ourselves, and we never had the federal involvement. Are  
 20 they that broke? Is that — is the United States government  
 21 so broke that they have to come because Alaska has \$20 billion  
 22 in their savings account? Do they have to be — feel that  
 23 they have to be a part of that, too? Are they going to start  
 24 taxing our permanent fund? I don't think so. I think you  
 25 people are headed for a serious revolution, is what I think.

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1 and I'm going to be right alongside of Tillie, and I'm going  
2 to be right alongside of Melvin.

3 'You people have forced us into a corner. We've got our  
4 o'm school board fighting against us because of federal  
5 issues. If you people cannot change your rules and  
6 regulations to match our constitution, then there will be a  
7 revolution. It says in our constitution that we have the  
8 right to benefit from the fruits of our industry, and now  
9 you've come here and shut down our industry. We don't have  
10 the fruits.

11 We don't even have the right to dig clams anymore without  
12 a permit. The rules and regulations are overriding us.  
13 There's a serious problem here, and I want you people to know  
14 that you're not going to drive a wedge between me and my  
15 Indian friends. We've grown up together. We've lived  
16 together, and you people are driving a wedge between us. The  
17 subsistence issue is bad; ANILCA is bad; the Tongass reform  
18 act is bad. Every time you come into the State of Alaska you  
19 come with a basketful of bad plans, and bad problems, and bad  
20 things that we cannot deal with. This is the last frontier.  
21 We're not afraid of trial and error. And we want you to know  
22 that we're not afraid of it, and we're going to unite and  
23 we're going to stand together. Indian country or no Indian  
24 country. Subsistence or no subsistence. We're going to stand  
25 together. We are Alaskans and we're not afraid of trial and

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1 error. That's what's made this state, and we're going to  
2 stick together.

3 I'm not pitting the Forest Service against the Department  
4 of Agriculture, but doesn't it stand to reason if we've had an  
5 animal habitat biologist as head of the Forest Service, and  
6 they took and initiated all these extinct animals that we  
7 don't have, and we know that we don't have them. And now  
8 they've taken and kicked that guy out so to speak, or put him  
9 into early retirement and got in a fisheries biologist now,  
10 and they're picking on the fishing industry. Do they want to  
11 see another boat decision in Southeastern Alaska, or in  
12 Alaska, to split the product in half, to split an industry in  
13 half? They can barely make it now because of the market.  
14 They're doing exact -- just the opposite of what they did in  
15 the timber. The timber's on the decline. The fish are on the  
16 rise. But there's no market for the fish, and now there's no  
17 market for the timber.

18 What's going on here? Don't the federal government want  
19 us to exist anymore? This is a resource state. This isn't no  
20 finished product state. I'm about to my end of the line. I'm  
21 about ready to move out of this country. I'd go back to  
22 Norway. I know how to talk Norwegian, but these people don't  
23 know how to talk Norwegian, and I grew up with them.

24 Is there any end to this? Just because the federal  
25 government cannot balance their budget, do they have to pick

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1 on Southeastern Alaska? They don't pick on Western Alaska  
 2 like they pick on Southeastern Alaska. Just because we don't  
 3 have any state land in Southeastern Alaska doesn't mean the  
 4 federal government can troop in here and take over the area,  
 5 when they've got more land, more federal reserve land in  
 6 airports and military reserves in the state than we have in  
 7 Southeastern Alaska total. We've done this to ourselves. I  
 8 realize it. We pit ourselves one against the other because in  
 9 the disaster fund the area that has the most land got the most  
 10 money. But the United States government doesn't look at  
 11 Alaska being one-fifth the size of the United States. They  
 12 don't step in here and give us credit for that. No. They  
 13 step in here and tax us every time we turn around. It's  
 14 either rules and regulations or taxes. And we're still  
 15 pioneering. We have problems within our own state. The  
 16 Eskimos don't care about our ferry system, and we don't care  
 17 about their whaling problems, and the federal government's  
 18 right in the middle of the whole shooting match every time.  
 19 We can't even settle our own issues.

20 Tillie come the other night and disgraced herself by  
 21 saying things she said against the last Chief of Saxman's son,  
 22 which is our representative. He's my representative, and he's  
 23 the reason that I'm an Independent Party voter, because when  
 24 te Republicans had the closed primary it ruled me out from  
 25 voting for the people I wanted to represent me. Now I am

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1 independent. But when I did it there was only 32 percent of  
 2 the people in the State of Alaska were Independent voters, and  
 3 now it's 58 percent. Now, doesn't that open the people's eyes  
 4 in the Lower-48? What's the matter? Are they jealous of that  
 5 \$20 billion? Let's give it to them. I say let's — they can  
 6 have my share of the permanent fund if you'll leave us alone.

7 If you want part of that permanent fund, you're more than  
 8 welcome to it. You've got my share. Thank you.

9 HEARING OFFICER: Thank you. Is there anyone else that  
 10 would like to come up and testify?

11 MR. BRISTO: My name's Tim Bristo and I'm from the  
 12 Southeast Alaska Conservation Council. I just wanted to say  
 13 a couple of brief things.

14 One thing I want to acknowledge, first of all, is the  
 15 Forest Service puts a lot of time, energy, and a lot of effort  
 16 into these EISs, and I know a lot of times SEACC's critical of  
 17 the finished product, and I just want to acknowledge that  
 18 there is a lot of hard work that goes into these EISs, and I  
 19 think one of the reasons there's been so much criticism coming  
 20 our of our organization in the past is the fact that we had a  
 21 long-term contract dictating how the timber sales were  
 22 arranged on the forest. And that's why I have concerns about  
 23 this timber sale as well.

24 That's no longer an excuse. The long-term contract's  
 25 over, and I think sales like this one in Lab Bay, I think that

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Bristo Testimony

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1 new's the time to change the way we do business here. I think  
 2 we can have some finished products here in Southeast Alaska.  
 3 I think it's going to take some transition. I think it's  
 4 going to take an influx of money, and I think it's going to  
 5 take some more creativity on the part of the Forest Service.  
 6 I kind of see that this sale is more of a continuation of the  
 7 program that we've had in the past, and there's too much road  
 8 building; the sale's too big, and I think that has to end. I  
 9 think maybe if you take a look at the sale in a new light,  
 10 figure out how we're going to first apply materials to the  
 11 communities of Prince of Wales Island, how we can — how we  
 12 can find some ways to maybe make some finished products on the  
 13 island to capture some more jobs and do it while cutting those  
 14 trees, I think that'd be a good idea.

15 I was at the public hearing the other night about  
 16 subsistence that Representative Williams held, and what  
 17 despaired me is there was a lot of talk about how ANILCA's  
 18 wrong, and how it's pitting people against each other, but  
 19 there was no talk of habitat law, and that's the real  
 20 overriding issue here. I've been to north Prince of Wales  
 21 Island quite a few times, and I've talked to people who live  
 22 there, and live off the land in those communities, and they  
 23 are seriously concerned about the deer population. And it's  
 24 due to the fact there's too much road, there's too much clear  
 25 cutting, they're worried about canopy closure of the forest in

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Bristo Testimony

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1 the future. The deer carrying capacity in that area has been  
 2 compromised because of logging. Now we have a chance to do  
 3 things differently.

4 I'm not saying we can't have any logging on the Tongass.  
 5 But, in the past, when you did a — had an 810 hearing like  
 6 this, when you looked at subsistence, it was done because it  
 7 had to be done. It wasn't looked at in a meaningful way.  
 8 I've talked to a lot of people in communities like Hoonah,  
 9 which are just beside themselves that the Forest Service have  
 10 laid out other sales near them and they're going to impact  
 11 their subsistence areas, and they're going to court to fight  
 12 over it. I think that there's now an opportunity to minimize  
 13 those conflicts, and I think that's what everybody wants. I  
 14 think we want to minimize those conflicts.

15 Protection of subsistence is written in SEACC's bylaws,  
 16 and we take that very seriously. We also think there should  
 17 be ample opportunity for sport hunters and sport fishermen as  
 18 well, and we think the best way to make sure that there are  
 19 fewer conflicts, and we don't have meetings like we had the  
 20 other night, is to protect habitat.

21 There was some criticism with the Tongass Timber Reform  
 22 Act. What TTRA did is sat the million acres aside which can  
 23 be used for just about every other use except for heavy  
 24 industrial logging, or building a big resort, or something  
 25 along those lines. Those are incredibly important subsistence

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Bristo Testimony

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1 areas. Go and talk to somebody in Hydraburg, whether they want  
2 to (Indiscernible) logged, and they'll say absolutely not.  
3 How many people here have gone and used Naha for the same kind  
4 of reasons? And they'll tell you that it's a very valuable  
5 place the way it is.  
6 And, I think just to reiterate here, and trying to keep  
7 it within sort of a subsistence vein, I really feel the future  
8 for the Forest Service in Southeast Alaska is more community  
9 based initiative. It's not something that's going to happen  
10 overnight, and it's not something that's going to be all that  
11 easy, but I really do think there are some opportunities to do  
12 things better than we have in the past. We don't have the  
13 contractors and planning process anymore, and this is the time  
14 to start that, immediately. And I'm just looking forward to  
15 being part of that, and hopefully between the draft and final  
16 stage with this sale, we can, you know, all sit down and think  
17 about some new creative ideas to minimize the subsistence  
18 impacts, and minimize — or just figure out ways of keeping as  
19 much wood as possible as close to home as possible. Thanks.

20 HEARING OFFICER: Thanks, Tim.

21 MR. CHARLES: Hi. Well, my name is Melvin Charles. I'm  
22 back at the table here again. And, speaking of subsistence,  
23 subsistence is for a greater, for a majority, control by the  
24 aboriginal, common people of the land. Subsistence is  
25 resources. For thousands of years, before the federal

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1 government was ever involved in this country of Alaska, our  
2 Native people have traded from the north to the south with  
3 timber. Under subsistence of resources, timber is resources.  
4 I really feel that our Native people should get our share  
5 of this timber that is allocated. Under our Native people, we  
6 have always had non-Native people working for us without  
7 restrictions. There should never, ever be any restrictions  
8 for us to have non-Natives working, or doing timber harvesting  
9 for them. I am still against the harvesting of timber, but  
10 any timber being harvested, that we likewise get our rightful  
11 share so that we could survive for our needs and employ, and  
12 keep our people off the welfare role. Thank you.

13 HEARING OFFICER: Thank you, Melvin. Now, is there  
14 anyone else who would like to come up and give some testimony?  
15 If not, what I'll do at this time is close the hearing for the  
16 time being, and we'll stay around and answer any questions  
17 that people may have. And if anybody changes their mind and  
18 would like to give us additional testimony we'll reopen the  
19 hearing.

20 I want to thank everyone for coming, and for sharing. I  
21 think everyone that shared tonight, it definitely came from  
22 the heart, and I really appreciate that. Thank you.

(Off the record)

(On the record)

25 HEARING OFFICER: Good evening. The time is now 8

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1 o'clock, and this is David Arrasmith again. I'd like to — an  
2 additional individual wants to give us some more testimony, so  
3 I'm going to reopen the hearing at this time. If you could  
4 again repeat your name for us so that we know who you are?  
5 MR. AMUNDSON: My name's Pete Amundson. I reside at 918  
6 Jackson in Ketchikan.

7 I just wanted to mention that it's real important to me  
8 to mention that when Ted Stevens comes here to march in the  
9 parade at the 4<sup>th</sup> of July, he does not have to have any  
10 bodyguards. When Ted Stevens comes here he's free to come and  
11 go when he wants to, and he does just that. He drives his  
12 car. He walked the full length of the parade in the Ketchikan  
13 parade this year, which is about three miles. He's over 70  
14 years old, and he's still doing a good job for the people of  
15 the State of Alaska. And because we only have one voice, Don  
16 Young, in Washington, D.C., and because we only have — and  
17 because he's got to divide his spots three ways for the people  
18 in the State of Alaska because of our party affiliation, he  
19 has to do a good job. But, when he comes to Ketchikan, he  
20 doesn't have to have no bodyguards. It isn't like in  
21 Washington, D.C. It's not like in Los Angeles. It's not like  
22 in Seattle. And they — when they come to Ketchikan they're  
23 free to come and go, and their wives and their kids. They do  
24 what they want to here.

25 We're not in a technical part of the world yet.

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1 Ketchikan is working real hard now to get telecommunications.  
2 They're working real hard to move into technology. We realize  
3 that technology is going to replace — the fiber optics is  
4 going to replace the fiber that we've lost in the timber  
5 industry. We know this. We can come out of it, but we don't  
6 need any more federal involvement. We don't need any more  
7 federal restrictions.

8 The people from Ketchikan Pulp Company, Mark Suwyn has  
9 come here, and he's sorry about what he had to do. He comes  
10 and he knows that we don't have money to build an aquarium.  
11 He comes and says he'll put his own money into an aquarium.  
12 He says that he feels good when he comes to Ketchikan because  
13 he's always greeted with open arms.

14 I don't know what to say. I'd say, Mark Suwyn, come back  
15 to Ketchikan any time you want. We'll welcome you with open  
16 arms. And I said you fought hard to keep Ketchikan Pulp open,  
17 and I appreciate that. It was the only major industry in  
18 Southeastern Alaska, and now we have to find an alternative.  
19 We have to find an alternative for the decline in the timber  
20 industry, because the timber industry also had with it a  
21 portion that goes to education and road building. That's  
22 going down the same drain. We're in a disgraceful situation.  
23 We don't like this. We like living like we did before. We  
24 had a good thing going.

25 I went to KIC, Ketchikan Indian Corporation, last night

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1 and made a presentation to them to get teleoptics, because we  
2 can become a system more like Bethel, Alaska, that is centered  
3 around a public radio station, but because we have Ketchikan  
4 Public Utilities, and I, myself, am guilty because I wanted to  
5 sell Ketchikan Public Utilities, but now it's a tool for us  
6 that's working in the right direction, in that they have the  
7 fiber optic cable that run all the way from Back Island, the  
8 sub sounding station, to Mountain Point.

9 What we're going to do is take part of this disaster  
10 money that we got. This disaster fund -- does the federal  
11 government think that we're back in a cave so far that we  
12 don't know what's going on? Why did they want to give us \$110  
13 million for our right that we should have for nothing? If  
14 they want part of the permanent fund money, whatever they  
15 want, we can share with them. We might not give them all of  
16 the 20 billion, but why do they keep restricting us? Every  
17 time we turn around it's a restriction. This isn't the Native  
18 people's way, and this is not my way. We're still in  
19 pioneering. We're still trying to make Alaska into something  
20 and be a part of it that would be -- the people of the lower-  
21 48 would be proud to have as a state. But ever time we turn  
22 around they're restricting us. They're putting a fence in, or  
23 they're building something we don't need. Who in the world is  
24 going to support the federal government when they're shutting  
25 down all the industry all the time?

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1 You go back on the Ohio River. I've got a river towboat  
2 license, too. You go back on the Ohio River and it's factory  
3 after factory, brick building after brick building, that's  
4 shut down. You say, what happened here? Oh, the federal  
5 government, when they come in here, they shut down this, or  
6 they've taken this away from us.

7 I have a brother-in-law that works at a textile plant  
8 back in Philadelphia, and he says that is the primary  
9 manufacturers in that industry would have had something in  
10 Southeastern Alaska, whether they hauled it in cement trucks,  
11 or dump trucks, or whatever, so that it was wet, if they could  
12 have taken the goo that come out of the digesters out at the  
13 pulp mill and put it into their plant, they could have saved  
14 28 percent of their gross. Would the federal government  
15 invite them like they did Ketchikan Pulp? They built a state  
16 of the art pulp mill that couldn't even outlast the contract  
17 that the federal government signed with them. This is another  
18 restriction to us. Twenty-eight percent of the gross. That  
19 14 percent is more than either one of them companies has ever  
20 made. Now the federal government has to subsidize it. It's  
21 a good business.

22 Who's running this country? I'm Norwegian. I was born  
23 at night. I had two strikes against me before I ever got into  
24 this, but I can -- I bailed myself out of this predicament  
25 that they put me in, and I'm not happy. An I want you to know

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1 that I'm not happy. I don't have anything against the Forest  
2 Service. I have Forest Service friends. Brad Powell is my  
3 friend. Paul McIntosh is my friend.

4 Paul McIntosh and myself work on the same committee that  
5 we're proud to be on. How can I go with an honest face and do  
6 a good job when he's part of something that I don't believe  
7 in? I'm going to do a good job because we're friends, but I  
8 want the federal government to know that I'm not going to  
9 participate in projects where I don't belong. If I feel like  
10 I don't belong, I'm not going to participate. And if I don't  
11 participate, that's when I stop paying my taxes. This is  
12 going to create a split between me and my government. I'm  
13 going to pay my property tax to the Gateway Borough, and I'm  
14 going to pay my city sales tax, but I don't think I should pay  
15 a tax to somebody that takes stuff away from me every  
16 opportunity they get.

17 Getting back to Paul McIntosh, we're doing the celebrity  
18 of the sea thing. Celebration of the sea we call it. We  
19 throw the wreaths. We honor the people that have been lost at  
20 sea, the Natives and the white men alike. We don't have to  
21 get into any kind of embarrassing situation over that. We're  
22 doing it for our own benefit.

23 I guess there comes a time when you have to talk bad  
24 about things that you really love. When I put my hand over my  
25 heart and pledge allegiance to the flag I have to grit my

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1 teeth sometimes, or bite my tongues, because there's parts in  
2 it that don't coincide with my state constitution.

3 I want to tell you a little story about a friend of mine.  
4 She's only four years old. We were talking about a school  
5 board member that got pushed into the corner in Ketchikan  
6 because of a federal issue. She says he used some four-letter  
7 words. And she said, I don't see nothing wrong with that.  
8 When my dad gets mad, he does the same thing. He just gets it  
9 out, gets it out in the open, we take our black eyes, he bites  
10 his tongue later and comes back and says he's sorry. We never  
11 get I'm sorry from the federal government. She's four years  
12 old.

13 So then we got to talking about taking God's name out of  
14 the pledge allegiance to the flag, taking it out of school.  
15 I said, well, one thing sweetie, we still get to put up a  
16 Christmas tree and celebrate Christmas anyway. She says, you  
17 mean they're going to try to make us quit celebrating Santa  
18 Claus' birthday?

Thank you.

19 HEARING OFFICER: Thank's Pete. At this time I'd like to  
20 close the hearing again, and we'll still stay around and  
21 answer any questions if anybody has any. Thanks.

(Recess at 8:10 p.m.)

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C E R T I F I C A T E

1  
2 SUPERIOR COURT )  
3 ) ss:  
4 STATE OF ALASKA)

5 I, M. JUNE ZENGÉ, hereby certify:

6 That the foregoing pages numbered 1 through 33 contain a  
7 full, true and correct transcript of proceedings held by the  
8 U.S. Forest Service with respect to the Chasina Timber Sale  
9 EIS, transcribed by me to the best of my knowledge and ability  
10 from tapes electronically recorded by me at the hearing.

11 DATED at Ketchikan, Alaska, this 27<sup>th</sup> day of March 1997.

12 SIGNED AND CERTIFIED TO BY:

13 *M. June Zenge*  
14 M. June Zenge  
15 Court Reporter



25 Zenge's Secretarial Services



## PROCEEDINGS

HEARING OFFICER: Good Evening. This is a Public Hearing, as provided by Section 810 of ANILCA, to receive testimony on how the alternatives proceed in the Chasina Draft Environmental Impact Statement may potentially affect subsistence users of the Tongass National Forest. This is also opportunity for you to provide comments about the economic and social effects of the alternatives on your community, or about other aspects of the Chasina Project. The Forest Service is also conducting a similar hearing in Saxman, March 20, 1997.

My name is Dale Kanen, and I've been designated by the Forest Service as the Hearing Officer for this proceeding. I want to thank you all for coming. The intent of this Subsistence Hearing is to make an official record of your testimony. We appreciate your interest and effort to be here and want to assure you that we will do our part to listen and record your comments.

For the record, today is March 18, 1997, and the time is 7:00 P.M. This hearing is being held in Hyدابург, Alaska at the ANB Hall. Public notification of this Hearing was made by publication in the Island News, the Ketchikan Daily News, and by notices posted on community bulletin boards.

There are some procedures I'd like to mention. This Hearing is scheduled to run until 9:00 P.M. If testimony is completed earlier, we will keep the record open until 9:00 P.M. to allow opportunity for additional comments. If you have not already done so, please sign in at the door and indicate if you wish to present testimony.

If individuals have the same testimony as others, the presenter can simply state that they stand with the Presenter X or Presenter Y who testified on this or that point. That type of statement is just as acceptable for the record as repeating the previous testimony. Also, written testimony will be accepted until April 25, 1997, which is when the comment period closes.

We are recording this Hearing so that we can prepare a transcript. The transcript is important because it, along with all the other written transmission, will be used by the Forest Service during the preparation of the Final Environmental Impact Statement and Record of Decision for the Chasina Project.

An opportunity to discuss and obtain information about the Chasina Project and the various alternatives, was provided during the Open House which proceed this Hearing. We will not be taking questions during the Hearing.

Testimony will be taken in the order received in the sign-up sheet. I will call your name; at that time please come forward; give me any written testimony you have; speak towards the tape recorder; state your name, and affiliation if appropriate; and proceed with your testimony. The first testimony will be given by Victor Burgess.

U. S. FOREST SERVICE

PUBLIC HEARING

DRAFT ENVIRONMENTAL IMPACT STATEMENT

MARCH 18, 1997

HYDABURG, ALASKA

MR. BURGESS: Mr. Chairman. My name is Victor Burgess. I've been on the Hydaburg Advisory committee for quite a few years. My testimony will speak to define terms and titling of ANILCA as we seen them.

The 810 Hearing process is worthless. How can any decision, either judicial or administrative, be reasonable on the term subsistence, which has never been legally defined. What is the cumulative impact on an unknown subsistence priority? Should we use the TRUC survey of the past to establish a priority? Number 80583d is quite clear. It establishes a yearly priority number and an evaluation of current and anticipated subsistence needs of fish and wildlife and does not refer to past uses under restrictive regulations which do not apply under Section 805 ANILCA. Until the Secretary addresses Section 805 of ANILCA, the 810 process is lost.

Those were pre-remarks. I have here a position paper that we presented to the Southeast Regional Council in Wrangell. I believe it was, February 7, 1996. The first part of it is just remarks from the Congressional records which we believe impact what we are going to say.

#### PRINCIPLE

Hydaburg Advisory Committee believes that before Title VIII of ANILCA can be properly defined, one principle of human rights must be recognized and that principle is: that people who originally owned and used all the resources are entitled to at least a modest living from those subsistence uses. This level or standard of living must be reached by individual Regional Councils to assure that regional differences in subsistence uses are adequately accommodated. The difference in subsistence uses should not be based only on kind and degree, but on the strength, health, and diversity of the wild renewable resources in each subsistence resource region.

#### TITLE VIII IS REMEDIAL INDIAN LEGISLATION

Title VIII of Alaska National Interest Lands Conservation Act is remedial Indian legislation passed by the Congress of the United States to fulfill the policies and purposes of the Alaska Native Claims Settlement Act. Although neither ANCSA nor ANILCA reflect a fair settlement of the aboriginal claims of Alaska Natives, our testimony will attempt to define Title VIII of ANILCA as we understand it. We believe that until the issues and terms contained in this act are clearly defined, the implementation of the subsistence regulations will result in a continuation of unauthorized restrictions, and for many subsistence users, a continuation of expensive time consuming litigation.

#### SUBSISTENCE

Subsistence is the customary and traditional use of fish, wildlife, and other renewable resources by Alaska Natives within tribally defined territory. Such uses are intended to foster the economic well being of Alaska Natives and their villages. By means of customary trade, barter, and sharing. Native people will be able to provide their cultural heritage and traditional way of life for future generations, and will be able to provide for themselves with a significant element of their diets.

#### RURAL

Now this is a definition really is ambiguous like most of this title is and we think that the canon of construction should be used in favor of the Indian tribes.

The Advisory Committee believes that rural areas or communities can only be defined by each individual Regional Council because of their local knowledge. The subsistence title and other subsistence provisions of ANILCA are derivative of the Alaska Native Claims Settlement Act; therefore, all definitions should be made contemporaneously. The State of Alaska has selected approximately 35,000 acres on Prince of Wales Island for community expansion and other uses and they propose to select another 36,000 acres. The Federal Subsistence Board, by defining all of Prince of Wales Island as rural, has created an absurd equation that will result in a quick ending of native subsistence rights.

We believe rural, in the Southeast Region, should be limited to the same Native communities that are recognized in the native Claims Settlement Act. The Hydaburg Advisory committee, therefore, makes a recommendation that the definition of rural be limited to "tribal villages not of a modern and urban character, where a majority of the residents are Native."

These are definitions that we believe haven't never been properly defined. Most of the scheduled ones are really, can't be sustained because they're too restrictive and they don't benefit the Indians.

The Hydaburg Advisory committee recommends that customary trade be defined as the amount of commerce necessary to foster the economic, physical, and cultural well being of Alaska Natives and their villages.

We believe that the State's reference to Title VIII legislative history does not define customary trade, and this is just like the Federal Government, who apes the State in this result, rather than it simply states what, among other things, customary trade is not. We believe that Congress intended that customary trade to have the same or similar meaning as the following excerpt from Black's Law Dictionary. I won't bother reading this, but I'll read what I think are the pertinent ones.



## CUSTOM

Can be pretty well defined.

## TRADE

Trade is the act or business of buying and selling for money, traffic, barter. Trade is not a technical word and is ordinarily used in three senses; one of which is: in that of exchanging commodities by barter or by buying an selling for money. As can be seen from these definitions, there isn't much room to qualify the term customary trade. There's others, but I'll submit this customary and traditional definition just with this paper.

And in closing, it is extremely important to emphasize the following points:

That ANILCA is Indian Legislation. Congress invoked its' constitutional authority over Native affairs and its' constitutional authority under the property clause and the commerce clause to protect and provide the opportunity for continued subsistence uses;

That the State of Alaska continues to foster a policy adverse to the interests of the cultural heritage of Native villages in rural Alaska and their people;

Alaska Natives assert their inherent rights of self government in a sincere attempt to resolve the many problems confronting the villages and people. The State of Alaska has expended vast amounts of scarce resources to frustrate and confound the tribal governments.

And this was written before the recent implementation of the million dollars to fight Indian country. So that concludes my remarks Mr. Chairman. I'll give this to you as a matter of record.

Thank you.

HEARING OFFICER: Thank you, Victor. The next person is Vicky LeCornu.

MS. LECORNU: I guess I'll start with my own definition. I have a definition for you. And it has to do with the fact that this the purposes for this deposition is suppose to be necessary. So I have a definition of necessary I'd like you to consider. This word must be considered in the connection in which it is used, as it is a word to set the bowl of various meanings. It may import absolute physical and necessity or inevitability, or it may import that which is only convenient, useful, appropriate, suitable, proper, or conducive to the end stock. And this sale is not conducive to any purposes sought under ANILCA and that is continued opportunities to subsistence uses. And so I object to the use of TUMP and Timber Reform Act is invoking ANILCA because it is contrary to ANILCA, or the original intent of ANILCA I should say, and I am contending the amendments of the Forest Service to change it.

Also the State data from TRUCS is basically flawed. It doesn't address future needs. It doesn't measure future needs and the inclusions of other, well it doesn't measure future needs. It measures past uses. TRUCS is not good for us because it doesn't concern our future needs.

And the purposes for the disposition, I'll get back to that again. The purposes for the disposition of this sale does not benefit the using of those plans for a priority and I noted in the studies and the books that the only uses I see are the deer, so I guess that's the only thing that's considered subsistence is deer and bear and marten and nothing else. So none of the traditional uses of the resources of the area are considered. And the results of the disposition lead the absurd results in what was to be Indian legislation. Like I said, results that allow only deer or furbearers for use or sale, use and/or sale. Results that will have detrimental effects for the beach fringe. Like I said, before any harvest proposed precludes any use by traditional users, personal use, etc., much less a very limited allowance for deer that is according to trust. That doesn't benefit Haida people. Any sale that doesn't benefit Haida people and the purposes contradict ANILCA's intended benefits, which I stated before. Deer harvest can be expected to be sustainable according to the statements in your first book, and that to me is not, ah not substantiated by any, ah needs assessments because there hasn't been any needs assessment.

I think that's everything I have to say. Thank you.

HEARING OFFICER: Okay. Thank you, Vicky.

Okay. Next on our list to testify I think is Vincent Jensen, ah Jameson.

MR. JAMESON: I guess Vicky and Victor have covered all the technical terms under ANILCA and ANCSA, but my testimony is short and to the point on subsistence and traditional use issues that are going to be affected by this proposed timber harvest, and my written testimony is as follows:

My name is Vincent Jameson. I am vice president of the Hydaburg Cooperative Association based in Hydaburg, Alaska. We are a federally recognized Tribal entity and expect the Forest Service to follow President Clinton's Memorandum of Understanding recognizing Government-to-Government relations between Alaskan Tribes and the United States of America. Now I testify in opposition to the proposed Chasina sale. The Chasina area timber harvest will now, and in the future, impact traditional usage in the West Arm area. The Alaska Department of Fish and Game requires only a 30 day residency period before state eligibility is established and the abuse of the resource begins. The Haida people only need to look to the Barrier Islands and remember a state fishery that decimated huge abalones stocks that will never recover. The abuse of traditional sockeye salmon usage under the guise of State issued

residency permits is another fine example of the State of Alaska and the United States Forest Service disregard to Tribal Resource Management. The arrogance of the Forest Service in continuing to offer our lands for sale without community, tribal, or rural subsistence user's knowledge or approval will not longer be passively accepted.

The areas on Prince of Wales Island offered for sale, are areas claimed by the Haida for traditional and historical usage. We are here today to offer testimony like all other citizens of the State of Alaska. Although our relationship is unique with the Federal government, this relationship fails to become recognized by the Forest Service at public functions such as this. The countless abuses by the Forest Service in failing to protect our lands. The countless efforts by the Forest Service to walk hand in hand with the Ketchikan Pulp Corporation do little to comfort the people of Hydaburg that sit and watch sale after sale of historical Haida lands with no direct benefit to our community. It is time to stop the process that contributes so little to our village, our traditional way of life, and to our economy. The option of "selecting no option" is our choice. A timber sale in the Juneau watershed is maybe more in order.

Thank you and I'd like to offer. I kept it short so hopefully it can be published and we'd like to recommend that the elders get a chance to speak on these issues and to give some historical back sight into the issue in 1954, when the Ketchikan Pulp Corporation came into being and all the hand loggers in the area were put out of work and the abuses that have been done by the Ketchikan Pulp Corporation on Prince of Wales Island and the proposed sale, whether it pertains to 63 acres or 350, it's still the same. It's whatever you compact a lot of logging companies in a small area, there will be a people will vie for the resources and that's what the testimony on the 30 day state requirements for resources as we know, we live here and we have to compete with outsiders for our dwindling our resource and I imagine this is a subsistence hearing or a traditional uses what more we like to consider it.

Anyway, Thank you.

HEARING OFFICER: Thank you, Vincent. Is there anybody else at this time who would like to testify for the record?

Could you sit a little closer to the mike please?

State your name.

MR. MORRISON: My name is Woodrow Morrison and I was born in Hydaburg right after we settled and moved from the old villages. Klinkwan, (Indiscernible), Kaigani, and all them old villages and I am 84 years old. I seen what I like to bring up is subsistence. How it's handled. It's depleting everything that we use for our food, hide, like deer. You people opened up subsistence, people from Seattle come up here hunt on (Indiscernible). I seen a truck load going on the ferry one day. Six lot of. I've talked with bear hunters. I can't see why you should advertise for people from the outside, where come in here and destroying our animals and our subsistence like

deer, our fish, smoked fishing, over run and stuff like that.

I'm taking wild because I can hardly read nor spell so. It's sad. In a few more years that subsistence will deplete completely. Our timbers will be gone and we Haida's don't have land. I know from the old ancient history that how much land us Haida's had here. If we move to where 10,000 years from now, Queen Charlotte Island, Haida (Indiscernible) Alaska source. And now that we're having.

Now I'll discuss what would better us, and you forestry departments got lots of power to control things. That's all I have to say, but to hunt in gears. That's over done. My shooting goats and mullock - 10 years I haven't shot a deer. If I want one, I ask a neighbor man to get me a deer. Maybe one after 2 years I got one this summer you know because I can't hunt no more. When you're six to a family, I think that's a limit you have for deer hunting for a family. That's too damn much. You hardly see any deer around here now on the road. There's over 100 bears and goats and bears. I've trapped all my life. I've trapped wolf. I've trapped ground otter. I've trapped mink, marten, for a living. I've raised seven kids. I've had to work in my golden days and the only things.

So that's all the only testimony I have.

HEARING OFFICER: Thank you, Woodrow.

Is there anybody else who would like to testify?

Okay. I'm going to go ahead and close the testimony period for the moment and we'll reopen again if some people would like to testify for the record and we'll go back to an informal session.







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